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IBM testing higher speed Token Rings

By Caryn Gillooly
and Michael Cooney
Network World Staff

WHITE PLAINS, N.Y. — IBM is experimenting with higher speed Token-Ring local-area networks and some day may offer an intermediate step between its 16M bit/sec LAN and high-end technologies such as 100M bit/sec FDDI.

According to sources, IBM already has a 64M bit/sec Token-Ring Network in its test labs. The vendor confirmed that it has experimented with higher bandwidth Token Rings but would not confirm reports about the 64M bit/sec net. Whether or not that speed was reached, IBM said it will not offer a 64M bit/sec LAN.

Executives, however, did not rule out the possibility of releasing a 32M bit/sec Token Ring.

"There is no question that IBM is looking at implementing LANs faster than its 16M bit/sec offering," said Tom Nolle, president of CIMI Corp., a consultancy in Voorhees, N.J. "It has done lab work increasing the Token Ring's speed in multiples of 16."

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AT&T revamps private-line pricing structure

Service	Speed (bit/sec)	Monthly charge	Charge per mile	Average rate change
Dataphone Digital Service	2.4K, 4.8K, 9.6K	$295	$0.35	0.9%
	19.2K	$340	$0.40	
	56K*	$340	$5.88	
Fractional T-1	9.6K, 56K/64K	$270	$0.32	2.5%
	128K	$495	$0.57	
	256K	$930	$1.08	
	384K	$1,315	$1.53	
	512K	$1,640	$1.92	
	768K	$2,130	$2.52	
T-1	1.54M	$2,500	$3.50	-10% to -15%
T-3	45M	$16,000	$45.00	2% to 4%

*For 0 to 50 mileage band.

GRAPHIC BY SUSAN SLATER SOURCE: AT&T, BASKING RIDGE, N.J.

Lab test of bridges shows real-world performance

Compares devices using normal-sized packets.

By Maureen Molloy
Senior Writer

SEA GIRT, N.J. — William James once noted, "There is no worse lie than a truth misunderstood."

Network managers evaluating internetworking gear would be wise to keep that in mind as they peruse vendor-supplied statistics about bridge performance. These statistics are often based on tests conducted using small data packets and do not necessarily indicate how well a bridge will perform in a real-world environment.

This was illustrated by Interlab, a network testing and consulting firm here, which just released results of token-ring bridge performance tests that show a wide diversity in performance among products under varying conditions.

"The implicit assumption has been that by measuring the number of small packets per second a [bridge] can transmit, you'd de-

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AT&T floats plan for private-line overhaul

Revamped pricing will result in higher prices for shorter circuits, price cuts for longer intercity links.

By Bob Wallace
Senior Editor

BASKING RIDGE, N.J. — Private-line king AT&T last week detailed plans to revamp the pricing structure and discount plans for its entire family of digital private-line services.

In a filing with the Federal Communications Commission, AT&T proposed rate cuts for T-1 service and rate hikes for T-3, fractional T-1 and its Dataphone Digital Service (DDS), as well as simplified pricing plans for these and other offerings.

With the filing, AT&T became the first of the Big Three carriers to announce volume discount plans for users that buy dedicated access from the carrier. Currently, only interoffice channel usage can be put toward volume discounts.

"Overall, we wanted to simplify our private-line pricing structure," said Joe Lueckenhoff, division manager for AT&T Accunet Spectrum of Digital Services (ASDS) and DDS. "This will allow us to serve customers' needs while keeping pricing in line with our cost structure."

But tariff analysts said AT&T's

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- Gator snaps at user's dial-up video links. Page 47.

NETLINE

CONSORTIUM SETS its sights on developing standards for system management. Page 4.

SUNLINK brightens picture for users linking SPARC workstations to NetWare LANs. Page 4.

CARRIERS, VENDORS tackle important task of shoring up CCS7 nets. Page 4.

ROUTER SOFTWARE helps users tie NetWare LANs to their Systems Network Architecture nets. Page 9.

CISCO HITS MARKET with low-end mux routers that use Flash EPROMs for remote upgrades. Page 15.

KANSAS BECOMES FIRST on Southwestern Bell's list of states to receive frame relay service. Page 17.

NEWSPAPER

Multivendor net challenge starts just as you finish

By Joanne Cummings
Senior Writer

Users that have battled to build multivendor networks often find that the real interoperability challenge begins after the network is up and running.

Running a multivendor net means dealing with a never-ending stream of equipment upgrades, new software products and releases that can cause a plethora of problems that impact interoperability. And finding the cause of those problems is frustrating, time-consuming and expensive, users said.

"It's a big problem," said Jeff Hafer, telecommunications manager at GPU Service Corp. in Reading, Pa. "Everything is working fine, and then you make one small change that's supposed to be totally transparent and it causes a problem."

And many say things can only get worse as more companies move to distributed computing. "It's insoluble," said Peter Kastner, a vice-president at Aberdeen Group, Inc., a Boston consultancy. "And it's bound to get worse before it gets better."

Hafer concurred. "We looked at adding desktop video to our network," he said. "No problem. It's a plug-in card, a camera, and everything works fine — in a stand-alone environment. When you put it into an existing base of word processing, spreadsheets,

(continued on page 4)

MCI to add call routing 800 option

By Bob Wallace
Senior Editor

WASHINGTON, D.C. — MCI Communications Corp. is developing an intelligent routing feature that will enable users to automatically route incoming toll-free calls among call centers without special automatic call distributor (ACD) software.

The 800-number feature would enable users to treat multiple call centers as a single virtual center by routing calls from busy sites to other centers — a capability that would help users deal with traffic spikes. Analysts predict that using intelligence in the MCI net to route calls should be less expensive and more flexible than using routing software on interconnected ACDs.

(continued on page 5)

Big Blue makes promise to enhance its OSI products

IBM reaffirms its commitment to Open Systems Interconnection; TCP/IP links for OSI in offing.

By Michael Cooney
Senior Editor

NEW YORK — OSI may be barely breathing, but IBM isn't sending it to the morgue just yet.

In 1993, IBM plans to enhance its flagship Open Systems Interconnection product — the OSI/Communications Subsystem — to include links to Transmission Control Protocol/Internet Protocol applications and more full-function directory services adhering to the Open Software Foundation, Inc.'s (OSF) Distributed Computing Environment (DCE) standards. The company also plans to introduce a service to help users configure and install OSI nets.

IBM reemphasized its commitment to OSI during interviews conducted in conjunction with a briefing on its open networking strategy here last week.

Now that TCP/IP has become the interoperability standard of choice for many users, IBM is focusing on interoperating and coexisting with OSI nets, rather than migrating users to them.

"We're not giving up on developing OSI products," said Peter Crotty, an IBM OSI product administrator. "That goes in spades

(continued on page 5)

Groupware show highlights emerging applications era

First commercial trade show draws big crowd.

By Timothy O'Brien
West Coast Bureau Chief

SAN JOSE, Calif. — Even though groupware is one of the fastest growing segments of the computer industry — predicted to be a $2 billion market by 1995 — leading analysts, users and vendors last week were calling for its demise.

At last week's GroupWare '92 conference here, industry watchers said the widespread use of networks will foster new applications that will provide transparent data access, information-sharing and collaboration capabilities, making the distinction between stand-alone and group applications irrelevant.

"Over the next three to five years, the line between stand-alone and group computing will just disappear," said Jim Manzi, chairman and chief executive officer of Lotus Development Corp. "People are now seeing that information has value only when it is communicated."

GroupWare '92, attended by approximately 2,000 people, was the first commercial trade show promoting this emerging software category. The conference sessions were packed, with more

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Getting users to buy GOSIP products like pulling teeth

By Ellen Messmer
Washington Correspondent

WASHINGTON, D.C. — This week marks the second anniversary of the Government Open Systems Interconnection Profile (GOSIP) program, but few in the federal sector appear to be celebrating.

Once touted as the mandate that would propel OSI into widespread commercial use, GOSIP now appears to be fighting a tough battle for acceptance even among government users.

According to a survey released last week on buying plans at the biggest government agencies, only a small percentage have begun to implement the GOSIP procurement mandate that took effect in August 1990. In addition, the survey showed that officials at 38% of the 150 agency sites queried nationwide do not know when they will start buying GOSIP-compliant products, and another 6% said they never will.

"There has been no progress on open systems," said Robin Rather, director of consulting and special projects at Information Strategies Group, whose findings on GOSIP are in the "1992 Desktop Survey" report.

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Briefs

'War and Peace' on a pinhead. Although still experimental, researchers at AT&T Bell Laboratories have demonstrated a data storage disk technology that offers data densities of 45 billion bits per square inch, the company reported last week. The technology, which uses a laser funneled through a super fine-tipped fiber-optic cable to change the polarity of magnetic particles on a disk, is said to offer 100 times the density of today's commercial magneto-optic technologies.

If Bell Labs can overcome uncertainties concerning read/write speed and bit error rates, the technology would make it possible to store two copies of "War and Peace" in an area about the size of the head of a pin. Ultimately, the technology may make it possible to store 200 to 500 billion bits per square inch.

Moths to the peer-to-peer flame. IBM this week will hold its first ever Advanced Program-to-Program Communications/Advanced Peer-to-Peer Networking (APPN) developers' conference. The company said it expects the conference in Raleigh, N.C., to be attended by more than 60 vendors. IBM said the conference will help it understand vendors' concerns about implementing APPC/APPN and will help it set an agenda for future products.

Spectrum battle turned up a notch in Congress. House Energy and Commerce Committee chairman Rep. John Dingell (D-Mich.) and Rep. Norman Lent (R-N.Y.) last week indicated they will fight Sen. Ernest Hollings (D-S.C.) on the issue of radio frequency spectrum allocation. Hollings had tacked on language to the Senate's Federal Communications Commission appropriations bill that would prohibit the FCC for eight years from reallocating spectrum used in power utility microwave networks to emerging technologies such as personal communications services. Dingell and Lent said Congress should not get involved in the frequency allocation process. The House and Senate must now go into conference to resolve the differences.

Switched digital group to share minutes. The Switched Digital Services Application Forum last week issued a guide to switched digital services and products at its meeting in Toronto. The guide, which is now available only to forum members, will be available to others in three to six months. A set of specifications that addresses advanced communications between videoconferencing systems and inverse multiplexers was also distributed. The specifications would let a videoconferencing system not only pass a telephone number on to an inverse multiplexer, but also specify a data rate or service type.

Net Management Forum takes AIMS. The Association for the Integration of Management Systems (AIMS) last week announced it has joined the Network Management Forum, a Bernardsville, N.J., industry consortium devoted to promoting interoperable network and system management systems. AIMS is a European organization dedicated to goals similar to those of the forum. AIMS' membership in the forum adds about 20 new European companies to the forum's roster.

Sprint gets the picture. Sprint Corp. and PictureTel Corp. last week announced a comarketing agreement under which they will offer Sprint's long-haul services in conjunction with PictureTel's videoconferencing systems. PictureTel now has comarketing agreements in place with the top long-haul carriers, while Sprint has aligned itself with all of the major U.S. videoconferencing system vendors.

CONTACTS

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NETWORK
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Net mgmt. group prods integration

By Bob Brown
Senior Editor

FRAZER, Pa. — A new consortium has been formed to speed development of standards for managing disparate computers, operating systems and applications across a network.

The Distributed Support Information Standards (DSIS) Group will identify user requirements and work with standards-setting bodies to define common specifications detailing how integrated management systems will communicate with and control distributed systems.

Initially, the DSIS Group is working with the Internet Engineering Task Force, which earlier this year formed a working group to design a Simple Network Management Protocol Management Information Base (MIB) for systems management, and the Open Software Foundation, Inc., which is defining systems management objects.

Formation of the DSIS Group — which is open to users, vendors and systems integrators at no cost — was spearheaded by Bell Atlantic Business Systems Services, Inc., a systems integrator that provides multivendor service and support. The other charter members are Hewlett-Packard Co., ICL PLC, Microsoft Corp. and Sun Microsystems Computer Corp.

"There has been a lot more focus on network management up to this point because that was a larger problem than system management," said Raymond Edgerton, chairman of the DSIS Group

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SunLink makes NetWare connectivity much easier

By Caryn Gillooly
Senior Editor

BILLERICA, Mass. — Connecting SPARC-based workstations to Novell, Inc. NetWare local-area networks was made easier last week with the introduction of a Solaris version of NetWare for Unix.

SunLink, the new product by SunSelect — a business unit of Sun Microsystems, Inc. — lets a Sun SPARCstation running the company's Solaris Unix-based operating system act as a node on a NetWare LAN, giving NetWare users access to Unix files and resources, and vice versa.

With the new product, NetWare users will be able to access the multitasking capabilities, development environment and built-in networking services provided through the 32-bit Solaris operating system, as well as the higher performance offered through SPARC-based machines.

The product is basically a Solaris-specific implementation of NetWare for Unix Version 3.11. It is a version of NetWare implemented as an application above the Solaris operating system on a SPARC-based machine, said Luiza de Ruijter, product manager for SunLink at SunSelect, based here.

Although this could allow the Solaris-based machine to act as a file server on the NetWare LAN, de Ruijter stressed that the new product is geared toward those customers looking to use the Unix machine as a distributed application server for a NetWare LAN.

"This is not a displacement server for native NetWare," she said. "For customers who need to

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The Reader Advocacy Force (R.A.F.) tackles the tough issues facing our readers — the buyers of network products and services. As consumer advocates, we want to hear about any problems you've encountered with products, service and support, or interoperability of equipment, as well as any other concerns you have.

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NETWORK WORLD'S
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READER ADVOCACY FORCE

Test net may shed light on way to solve CCS7 outages

By Anita Taff
Washington Bureau Chief

CHICAGO — A group of 14 local and long-distance carriers and manufacturers announced here last week they will establish a test network to simulate and find ways to prevent outages in Common Channel Signaling System 7 (CCS7) networks.

The net, which is being coordinated by the Network Operations Forum (NOF), a work group of the Exchange Carriers Standards Association, will test SS7 equipment from multiple vendors. It will initially include test labs from six carriers and manufacturers and comprise some 60 SS7 links.

The need to establish the test bed was largely prompted by several SS7-related net outages last year. Bell Atlantic Corp. and Pacific Bell had a series of outages caused by a glitch in SS7 software that disrupted local service to millions of people for several hours over a two-week period.

Although an initial test network was hastily constructed to determine and replicate the cause of those outages, NOF has decided to expand on that work and test a number of different outage scenarios. The tests will attempt to ferret out potential weaknesses in the SS7 protocol, software and hardware, said Rich Harrison, NOF moderator.

Harrison said this will be the most extensive test of the interoperability of multiple carriers' SS7 networks ever conducted. He said one of the principal areas the group will explore is whether an outage in one carrier's SS7 network could spill over into another carrier's net.

This is particularly important because local and long-distance carriers are beginning to interconnect their SS7 nets to support nationwide call setup and signaling, as well as new advanced features such as 800 portability.

The test will be divided into three phases. The first test, dubbed Phase 0, will be conducted for three weeks beginning Aug. 10 and will involve testing three outage scenarios — several SS7 links failing one after the other in rapid succession, several SS7 links failing at once and several SS7 links failing but then coming back up and going down again. The Phase 0 net will include T-1 circuits running between six test labs owned by: Ameritech, AT&T Network Systems, Bell Communications Research, Northern Telecom, Inc., Nynex Corp. and Sprint Corp.

NOF has not finalized tests for Phases I and II. Phase I will include additional carriers from Phase 0 and will test some of the same outage scenarios in addition to new tests, Harrison said. The group is currently talking with potential participants to see which has test lab equipment available for Phase I, he said.

AT&T floats plan for overhaul

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private-line rates are high and increasing competitive pressure is forcing the company to cut them.

"I predict a rapid response from MCI and Sprint, especially once they realize that AT&T could become the cheapest provider of long-distance T-1s [over 300 miles]," said Mike Hills, president of HTL Telemanagement, Ltd., a Burtonsville, Md., tariff analysis and net design firm.

AT&T has proposed simplifying rates for its T-1, T-3, fractional T-1 and some DDS services by replacing the banded pricing scheme with fixed monthly and per-mile charges.

The high-end 56K bit/sec DDS service, however, will still use the older scheme, which carries fixed monthly costs and per-mile prices that vary depending on what mileage band the circuit falls into, such as 1-50, 51-100, 101-500 and over 500 miles. In general, the changes will increase charges for shorter interoffice channels and decrease costs for longer interoffice channels.

The changes will cut rates for the interoffice channel segment of AT&T's Accunet T1.5 service by an average of 10% to 15% for long links. The proposed interoffice channel rates — $2,500 per month plus $3.50 per mile (see graphic, page 1) — mean users with a 50-mile T-1 would see a 36% decrease, while those with 100-mile links would see a 10% decrease.

The changes will increase rates for the interoffice channel segment of the carrier's Accunet T45 45M bit/sec T-3 service — its highest capacity service — by an average of 2% to 4%.

That translates into increased costs for links shorter than 85 miles and decreased costs for longer circuits. For example, a company with a 50-mile T-3 link will see a 23% increase, while users with a 3,200-mile link will see a 29% decrease.

The proposed changes for ASDS fractional T-1 service will increase the interoffice channel segment links by an average of 2.5%, although some circuits will become less expensive. For example, 50-mile 256K bit/sec links would see a 21% price hike, while costs would decrease 4% for a 3,000-mile connection. AT&T says the ASDS 256K bit/sec rates are representative of other ASDS speeds.

The proposed changes would also raise the analog multipoint charge for ASDS from $15 to $30 per analog termination, as well as establish a $15 multipoint charge

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Multivendor net challenge

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host connections and other things — that's chaos."

Faced with this situation, net managers are taking steps to minimize problems — including establishing interoperability testing facilities, holding off on new products or abandoning the multivendor net vision altogether.

Dick Bretagne, chief information officer at Northwestern Memorial Hospital in Chicago, said integrating new software packages and upgrades became so problematic that the hospital had to establish a quality assurance team to identify and solve potential problems before products make it into the network.

He said three full-time employees are devoted solely to testing network hardware and software for interoperability. "Their whole role in life is to ensure stable installations," he said. "It's a lot less expensive than trying to go with a classic all-blue IBM network."

The team has enabled the hospital to successfully manage the move away from centralized applications and to a distributed application environment.

Blaming the vendors

While users would love to have the vendors involved tackle the problems caused by their products, it isn't always possible.

"If you have a problem, none of the vendors can recreate your specific environment exactly, so they all think it's somebody else's fault," said Keith Sievers, vice-president of information processing and treasurer at Federal Kemper Insurance Co. in Decatur, Ill.

Hafer suggested setting aside

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MCI to add call routing option

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The MCI routing feature would close the gap between MCI and AT&T, which already has a similar feature — Alternate Destination Redirection — in place.

Dana Knowles, a member of the marketing communications segment of MCI's Enhanced Voice Services, which developed the feature, said the capability will be announced at the Tele-Communications Association, Inc. conference in San Diego next month.

According to Knowles, the call routing feature is vital to MCI's efforts to grow its 800 business.

Knowles declined to discuss the feature in detail, but a source briefed by MCI explained it.

According to Mark Langner, an associate with TeleChoice, Inc., a Montclair, N.J., consultancy, MCI will send an 800 call through its network to the point of presence (POP) closest to the terminating site.

That POP will use Integrated Services Digital Network's D signaling channel to query the ACD at the user site, Langner said. If all agents at the center are busy, the terminating POP instructs the originating POP to reroute the call to an alternative site.

Langner said MCI's network will eventually have the intelligence needed to hold the call at the originating switch and look ahead across the network to see if the destination can take the call before actually releasing it.

Call center experts heralded the 800 routing feature as yet another big step forward for MCI. Earlier this year, MCI detailed plans to install ACDs in its network to offer a net-based ACD service that would save users the cost of buying their own ACD equipment ("MCI weighs services for ACD nets," *NW,* Nov. 4, 1991).

"This feature is an excellent example of what MCI can offer in terms of call routing capabilities by using its increasingly intelligent network," said Bill Church, president of Call Center Solutions, a Florham Park, N.J., consultancy that helps users design call centers. "I expect users to take a very close look at it when formulating their call center design strategy."

"This is a major step forward for MCI," said Langner. "They want to be more than a distant second to AT&T in terms of customer base and would like to put some distance between themselves and Sprint."

Knowles said the intelligent routing will be offered as an optional feature with MCI's Enhanced Call Routing but would not say whether the carrier planned to charge users for it.

Church and others said carriers should be offer routing as a standard feature.

"Anything that carriers can do to complete a greater number of 800 calls starts the meter running," Church said. "They don't get paid for calls that aren't completed. But [MCI] will probably rationalize charging for the service by saying that they should be paid for queuing calls in the network for its 800 customers." ◻

Big Blue makes promise

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for OSI/Communications Subsystem."

OSI/Communications Subsystem is software that implements OSI Layers 3 to 7 on IBM's MVS, VM, OS/400 and OS/2 platforms. It provides links to other OSI nets, OSI services such as high-level application program interfaces, and session and network management capabilities.

IBM intends to add the ability for TCP/IP users and applications to access OSI/Communications Subsystem applications such as X.500 and File Transfer, Access and Management (FTAM), Crotty said.

"We want to let users who are investing in TCP/IP get to OSI applications without having to redo their entire TCP/IP backbone," Crotty said. "TCP/IP users then will have better file transfer and directory services using their existing equipment."

According to Crotty, IBM will also give OSI/Communications Subsystem support for full-blown X.500 directory services, replacing the subset intended mainly for programmers that is included in the first releases, 1.0 and 1.1. For example, those versions don't contain the wide-ranging global naming service.

The vendor will implement

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1 ☐ Request for sales call
2 ☐ Request for proposal
3 ☐ Request for information

2. Purchase timeframe
4 ☐ Within 60 days
5 ☐ Within six months
6 ☐ Within one year

3. Scope of purchase responsibility
7 ☐ Enterprise wide
8 ☐ Departmental

4. Purchase influence/number of sites
9 ☐ One site
10 ☐ 2-9 sites
11 ☐ 10-20 sites
12 ☐ 21+ sites

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NETWORK WORLD

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DATA NET ARCHITECTURES

NETWORK ARCHITECTURES, DATA NETWORK EQUIPMENT, STANDARDS AND ENTERPRISE NETWORK MANAGEMENT

Worth Noting

> "SNA is where the real market is for frame relay services — especially in Canada, where all anyone can afford is multidropped lines or a public X.25 net."
>
> **Tim Lambie**
> Manager of integration services
> National Telecommunications Corp.
> Toronto

Data Packets

Micom Communications Corp., based in Simi Valley, Calif., recently announced new voice compression code that reduces by nearly 50% the bandwidth required to transmit voice over low-speed lines using its Marathon Data/Voice Network Servers.

The new code will let users squeeze one to four more calls per 9.6K, 56K or 64K bit/sec line by sending calls over 4.8K bit/sec channels, down from the previous low of 8K bit/sec.

The code comes in a $1,100 voice module for the Marathon four-channel 1K and eight-channel 5K servers.

Frame Relay Technologies, Inc. of Costa Mesa, Calif., last week announced that its FrameMux 1200 frame relay switch has been deemed compliant with CompuServe's Frame-Net public frame relay service.

FrameMux pricing starts at $8,080 for a configuration supporting three serial 64K bit/sec synchronous/asynchronous ports and a trunk or public carrier access line rate of T-1 or E-1.

Additional synchronous ports are available at a price of $1,250. Ethernet ports, which cost $1,150, are also available.

Wang package helps link LANs to multivendor nets

Supports ties to DEC, IBM and Wang machines.

By Wayne Eckerson
Senior Editor

LOWELL, Mass. — Wang Laboratories, Inc. recently announced an integrated suite of Wang and third-party communications products that should make it easier for customers to incorporate Wang hardware and office applications into PC LAN operating environments.

Wang's Connectivity Platform consists of 11 connectivity tools customers can use to build integrated client/server environments. Wang will help users integrate the products, which it resells, into existing net environments and will act as a single point of contact for problem resolution.

The Connectivity Platform is designed to enable Windows-based personal computer users on local-area networks to access data and applications on Wang RISC Series Unix processors, as well as mid-range and host computers from Wang, IBM and Digital Equipment Corp.

"Many vendors refer their customers to third parties to solve their integration problems," said John Dorr, senior manager of open systems marketing at Wang here. "By purchasing these connectivity products from Wang, customers have the convenience of one-stop shopping for products and support services."

One reason Wang is offering the Connectivity Platform is to make it easier for customers to integrate the new RISC Series Unix systems, which are based on IBM RISC System/6000 computers, into PC LAN environments, Dorr said. Another reason is to help Wang customers make the transition from proprietary Wang and other host systems to industry-standard LANs, operating systems and user interfaces.

Dorr added that the Connectivity Platform will make it easier for customers to implement Wang's recently announced

(continued on page 10)

Phaser packs help NetWare, SNA nets work together

By Michael Cooney
Senior Editor

SOUTH SAN FRANCISCO, Calif. — Phaser Systems, Inc. has made it easier for users to tie NetWare LANs to their Systems Network Architecture nets with a new version of its SNA router software.

Phaser repackaged its NetWare SNA Router, making it easier to install, and added a new graphical user interface (GUI). The new package also features a threefold increase in file-transfer speed, thanks to better data compression.

The NetWare SNA Router lets SNA shops use their existing SNA backbone to transport data between remote NetWare local-area networks. When used with Phaser's NetWare SNA Hub Router on the mainframe, the product also lets NetWare users access SNA hosts.

The new Phaser router software resides in either a DOS PC linked to a NetWare server or an Eicon Technology Corp. DOS-based SNA gateway.

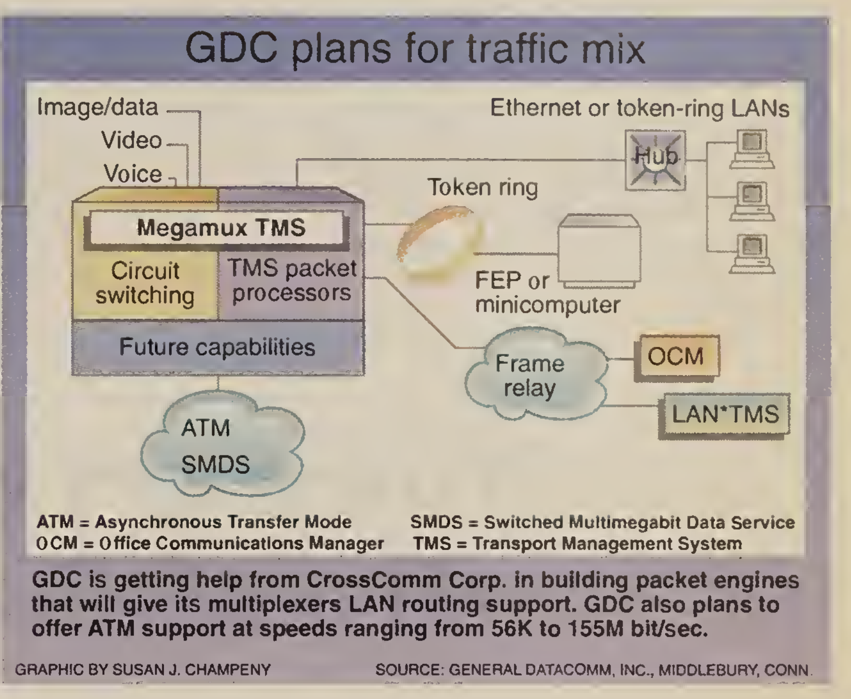
A NetWare Loadable Module incorporating the Phaser SNA Router will be available for the NetWare for SAA server this fall, said Kurt Ziegler, vice-president of Phaser marketing, sales and engineering.

When the NetWare for SAA module becomes available, as many as 60 NetWare sessions could be supported through one router. Today, a maximum of 10 sessions can be supported by the gateway or stand-alone configurations.

The router appears as another NetWare LAN to existing NetWare servers. NetWare traffic destined for remote servers or LANs is passed through the Phaser router, which encapsulates the data in IBM LU 6.2/Advanced Program-to-Program Communications packets and ships it across the SNA net to compatible gateways on other NetWare LANs.

(continued on page 10)

GDC plans for traffic mix



ATM = Asynchronous Transfer Mode
OCM = Office Communications Manager
SMDS = Switched Multimegabit Data Service
TMS = Transport Management System

GDC is getting help from CrossComm Corp. in building packet engines that will give its multiplexers LAN routing support. GDC also plans to offer ATM support at speeds ranging from 56K to 155M bit/sec.

GRAPHIC BY SUSAN J. CHAMPENY — SOURCE: GENERAL DATACOMM, INC., MIDDLEBURY, CONN.

GDC to add routing modules to T-1 mux

Extends OEM deal with CrossComm to include joint development of packet processor engines.

By Jim Duffy
Senior Editor

MIDDLEBURY, Conn. — General DataComm, Inc. (GDC) has expanded its OEM relationship with CrossComm Corp. to include the joint development of packet processing modules that will give GDC's multiplexers support for LAN routing and ATM.

T-1 multiplexer maker GDC has been reselling CrossComm ILAN routers under an OEM arrangement for more than two years. The extended arrangement, worth another $10 million to CrossComm, will result in local-area network bridging and routing engines, dubbed packet processors, for GDC's high-end Megamux Transport Management Systems (TMS) and its Office Communications Manager (OCM) feeder multiplexers, plus a new management system.

The bridge/routing products, which had been expected, will be released early next year ("GDC to add LAN routing module to high-end mux," *NW*, June 29).

By extending its CrossComm relationship, GDC is attempting to jettison its image as a supplier of only wide-area transmission gear, said Jonathan Reeves, GDC's director of systems architecture.

"This is a repositioning of the company," he said. "We're bringing together the local- and wide-area environments, and building an architecture and strategy around multimedia networking."

GDC's strategy will bear fruit next year when it unveils Ethernet and token-ring bridge/router packet processor modules for its Megamux TMS. Each module will sport four Intel Corp. i960 Reduced Instruction Set Computing processors, four Ethernet or token-ring ports and two 2M bit/sec frame relay ports.

The packet processors will support CrossComm's proprietary Protocol Independent Routing technology, which provides more fault tolerance and efficiency than source-route bridging for Systems Network Architecture and Network Basic I/O System traffic protocols but does not require encapsulation. The modules will also route Novell, Inc. Internetwork Packet Exchange (IPX), Transmission Control Protocol/Internet Protocol, AppleTalk and Digital Equipment Corp. Local Area Transport protocols.

Each module will have a total switching capacity of 30,000 packet/sec, Reeves said. A single Megamux TMS will support as many as four of the cards, enabling a single TMS node to provide switching, bridging or routing for as many as 16 LANs.

The Ethernet and token-ring packet processors for the OCM, meanwhile, will sport a single i960 microprocessor, a single Ethernet or token-ring port and

(continued on page 10)

Package links LANs to multivendor nets

continued from page 9

OpenImage desktop imaging software, which runs on Windows-based PC clients and Wang's AIX-based RISC Series processors.

"The Connectivity Platform allows users to protect their investments in existing proprietary host systems, such as Wang VS minicomputers, while migrating to an open systems environment consisting of [Windows-based] PCs, industry-standard LANs and Unix servers," Dorr said.

Greg Cline, a communications analyst at the Information Strategies Group in Vienna, Va., said, "Taking off-the-shelf products and integrating them is a distinct way to add value to products. Wang's announcement goes beyond the tendency of old-line minicomputer vendors to simply slap the label 'open' onto their products and ship them out the door."

The baseline product that users need to purchase from Wang in order to provide the foundation upon which the other products sit is Novell's LAN WorkPlace for DOS 4.01, which provides DOS and Windows-based PCs on NetWare LANs with access to Unix servers using the Transmission Control Protocol/Internet Protocol.

Other products include Beame & Whiteside Software, Ltd.'s Network File System (NFS) for LAN WorkPlace 2.20 and VisionWare, Ltd.'s PC-Connect 6.1.

Each item in the Connectivity Platform is priced separately but can be purchased through Wang. The only required product, LAN WorkPlace for DOS 4.01, is priced from $450 to $12,995, depending on the number of users supported. ◘

Phaser packs help NetWare, SNA nets

continued from page 9

The router supports NetWare Internetwork Packet Exchange/Sequenced Packet Exchange (IPX/SPX), AppleTalk and Transmission Control Protocol/Internet Protocol data and works with NetWare Versions 2.15 and higher.

Users also have the option of linking the router with Phaser's NetWare SNA Hub Router on MVS or VM mainframes. The NetWare SNA Hub Router, when used with Phaser's NetWare for MVS and VM on the mainframe, lets customers use the mainframe as a large file storage and backup platform for the NetWare LANs.

"Phaser is focusing on complete net integration," said Dick Boyle, program director for local-area communications at Gartner Group, Inc., a Stamford, Conn., consultancy. "Phaser provides the NetWare pieces in an SNA environment that Novell won't. It's [also] a great solution for users who need to back up their NetWare servers."

The NetWare SNA Router software is available for $2,695. The SNA Hub Router software on the mainframe costs between $12,000 and $36,000, depending on the mainframe's size. NetWare for MVS and VM is offered in Batch & File, as well as Virtual Disk 286 and 386 programs. The Batch & File software is available for between $4,800 and $14,400, while the Virtual Disk software is priced between $2,400 and $12,000. ◘

GDC to add routing modules to T-1 mux

continued from page 9

one 2M bit/sec frame relay port. The OCM initially will house a single LAN bridge/router module but eventually will support a maximum of four. One TMS packet processor will be able to support up to 128 physical channels, Reeves said.

GDC's Asynchronous Transfer Mode switching strategy, meanwhile, is intended to support speeds ranging from 56K to 155M bit/sec. The company plans to use 20-bit microcells to transmit switching instructions inside the TMS node in order to reduce delays when handling low-speed circuits, such as 9.6K bit/sec voice, Reeves said. The typical 53-byte cell will still be used on all wide-area ATM links, independent of their speed. However, he did not say when the packet processors will support ATM.

The new management system, meanwhile, will be based on Hewlett-Packard Co.'s OpenView management system and run under Microsoft Corp.'s Windows operating system on an Intel i486 personal computer. The system, which has not been named yet, will support CrossComm ILAN agents and use Management Information Bases specific to GDC's TMS and OCM muxes. It will also let users diagnose faults on sessions between a client workstation and a server on a remote LAN.

The TMS bridge/router modules will cost from $10,000 to $20,000, while the OCM modules will range in price from $4,000 to $8,000. The management system will be priced from $5,000 to $10,000. ◘

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LOCAL NETWORKING

LAN HARDWARE, NETWORK OPERATING SYSTEMS AND LAN MANAGEMENT

Worth Noting

In a recent study by International Data Corp., 47% of the network administrators surveyed said their company had no coherent plan to improve control over internetworked LANs and 53% said they plan to centralize LAN control.

Netnotes

Macintosh users who dare to can opt to run Microsoft Corp. Windows and Windows applications on their computers by year end.

Insignia Solutions, Inc. last week announced a new version of its SoftPC at MacWorld Expo/Boston. The software emulates an Intel Corp. 80286 microprocessor computing environment on Apple Computer, Inc. Macintoshes, enabling the Macintoshes to run DOS and its companion graphical user environment, Windows.

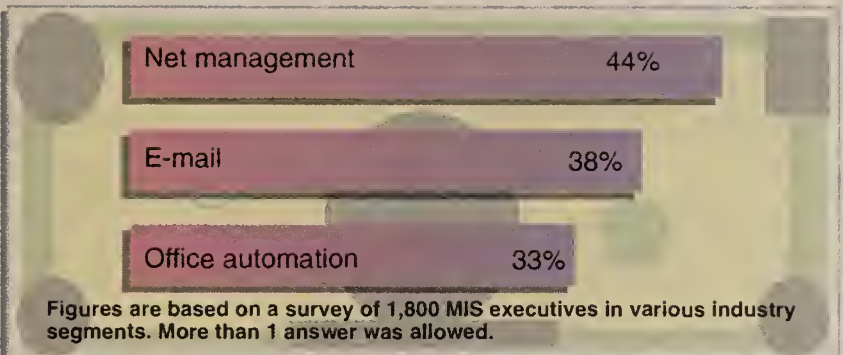
The software will come bundled with preinstalled versions of MS-DOS 5.0 and Windows 3.1, and will support VGA graphics. It will cost $649. In addition, the pack will include emulation for an Intel math coprocessor, which speeds Windows operations, and new drivers to control mouse movements and window sizing.

Also at MacWorld Expo last week, **Digital Products, Inc.** took the wraps off SprintTalk/200TR, a converter that connects LocalTalk printers to Macintosh token-ring networks.

The device will cost $1,395 and will be available in October, when the company also plans to ship a $795 LocalTalk printer connector for Ethernet.

What applications are you buying?

LAN administrators are still spending the majority of their application dollars on network administration tools.



Figures are based on a survey of 1,800 MIS executives in various industry segments. More than 1 answer was allowed.

SOURCE: BUSINESS RESEARCH GROUP, NEWTON, MASS.

3Com software lets users manage desktop devices

LinkWatch extends SNMP to LAN adapter cards.

By Bob Brown
Senior Editor

SANTA CLARA, Calif. — 3Com Corp. last week announced a new Simple Network Management Protocol-based software package designed to let users manage their networks down to the personal computer level.

3Com's LinkWatch will enable the company's plethora of Ethernet adapter cards to be managed via any SNMP-based management station supporting Management Information Base II, such as Hewlett-Packard Co.'s OpenView and SunConnect's SunNet Manager.

Using LinkWatch, a network manager can isolate errors affecting network performance and obtain data about each net node, such as the brand of PC or the end user's name and phone number. Net managers can also use the software to remotely turn a node on or off.

LinkWatch consists of three pieces: manageable Network Driver Interface Specification (NDIS) and Novell, Inc. NetWare driver software that resides on 3Com's adapter cards; a SoftHub/NetWare Loadable Module (NLM) that resides on a server running NetWare 3.11 or higher; and the LinkWatch Monitor utility, which is software that enables the SNMP management station to automatically discover the addresses of all adapters that need to be polled.

Net managers use LinkWatch by configuring their SNMP management station to poll the 3Com adapter cards at a predefined interval. The polling request travels from the management station to a server running the SoftHub/NLM, which serves as an SNMP proxy agent. The NLM translates the SNMP message into 3Com's proprietary management driver protocol and collects data from the adapter cards. That data is then returned by the SoftHub/NLM server to the SNMP management station.

"The product helps me know exactly where network traffic is being generated from," said Larrie Christianson, local-area network administrator for the State of Wisconsin Department of Public Education in Madison. "If I ask end users for this type of information, I usually get pretty vague answers."

Using LinkWatch, a network manager can isolate errors affecting network performance and obtain data about each net node.

▲▲▲

Christianson, a beta user of the LinkWatch software, is testing the offering in conjunction with HP's OpenView.

One potential problem with extending SNMP management to the desktop is information overload, acknowledged Roy Johnson, director of product management at 3Com. However, sophisticated SNMP-based managers,

(continued on page 18)

Compaq to rev up SystemPro's power

Will announce server upgrade boards to increase speed, performance of even earliest versions.

By Caryn Gillooly
Senior Editor

HOUSTON — Compaq Computer Corp. this week is expected to announce upgrade boards that will more than double the power of its SystemPro servers.

With the boards, which are based on Intel Corp.'s new 66-MHz 486DX2 chip, even customers with Compaq's earliest SystemPros and SystemPro LTs can configure their existing systems to perform like higher end superservers.

"The new boards will offer faster speeds, the significance of which will be seen in increased database performance," said Virgil Hornstein, director of North America systems product marketing at Compaq, based here. "Customers will also see increased performance in [Novell, Inc.'s] NetWare and other file server environments."

The 66-MHz 486DX2, which is the most powerful Intel microprocessor available today, will be available on two Compaq boards.

The 486DX2/66 System Processor Board for the Compaq SystemPro not only includes this chip, but also houses a new 512K-byte ServerCache, which lets the server accept more data requests at one time and process them more efficiently. The board thus provides increased performance for both processor-intensive applications and data-intensive applications such as database queries.

Processing power doubled

Because the SystemPro supports dual processors in Banyan Systems, Inc. VINES, The Santa Cruz Operation, Inc.'s Unix and Microsoft Corp. LAN Manager environments, these customers will be able to install two of the new boards, more than doubling existing processing capabilities.

The other card, the 486DX2/

(continued on page 18)

Show 'n' tell no longer child's play

By Margie Wylie
Senior Editor

MOUNTAIN VIEW, Calif. — SunSolutions, Inc. last week introduced a desktop conferencing package that lets users on Sun Microsystems, Inc. SPARCstations play show-and-tell with colleagues on the same LAN or on the other side of the world.

Named after the familiar childhood classroom exercise, ShowMe will allow an unlimited number of SPARCstation users to simultaneously view and annotate image or text over a Transmission Control Protocol/Internet Protocol local-area network or even the Internet.

Like other conferencing programs, ShowMe is made for professionals such as engineers, who may need to jointly discuss a graphic or figures but are scattered throughout various locations. Although not the first of its kind, ShowMe aspires to being the easiest to use, said Cynthia Walden, SunSolutions marketing manager.

"We wanted to make computer conferencing feel as natural as possible, and computer conferencing is a pretty artificial thing," she said.

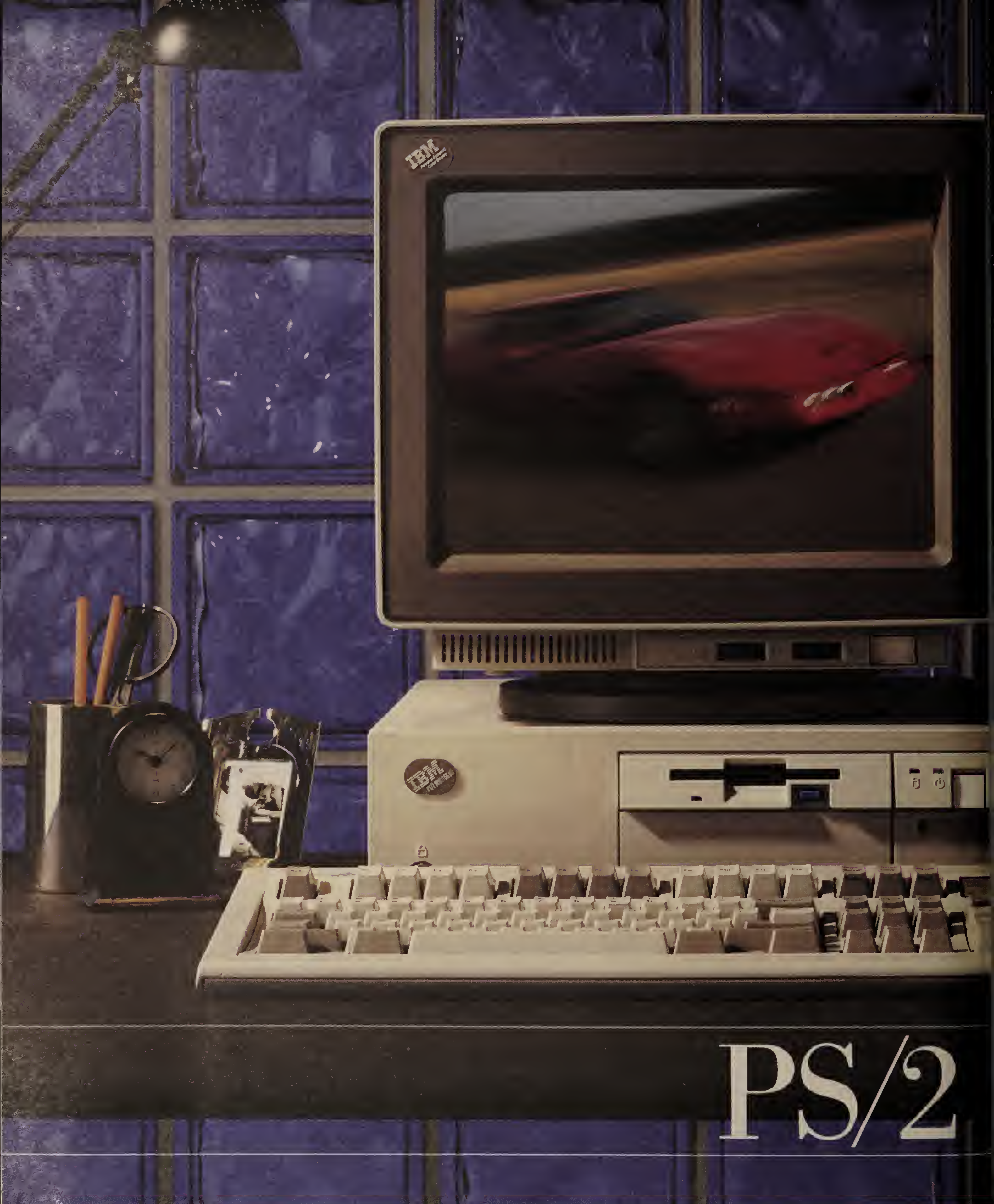
Using the white board

The program works by allowing users, each represented by a different color marker, to cut and paste any image on the desktop to a shared "white board." Spreadsheet cells, graphics, text or even ShowMe menu bars can be moved to the shared area by clicking on them with the mouse and dragging them onto the white board.

Using the board, users can mark the items, move or print them, or they can just use their color marker to point since ShowMe makes every user's stylus visible, even when they are not marking items.

When conferees agree on a change to be made, the user on

(continued on page 18)



*NSTL test conducted against 386 SX and 386 DX systems. **Sale or delivery of the IBM PS/2 486SLC2 Processor Upgrade is subject to FCC approval. Planned availability of the IBM PS/2 486SLC2 Processor Upgrade is 4th quarter 1992. Offer available from June 11 through October 1, 1992. HelpWare available only in U.S.A. IBM, PS/2 and OS/2 are registered trademarks and HelpWare and HelpCenter are trademarks of International Business Machines Corporation. Windows is a trademark of Microsoft Corporation. © 1992 IBM Corp.

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Worth Noting

> "A major battle — APPN vs. TCP/IP Tunneling [or] open vs. proprietary — is brewing."
>
> **Nick Lippis**
> Principal and founder
> Strategic Networks Consulting, Inc.
> Rockland, Mass.

Link Notes

Ungermann-Bass, Inc. last week announced NetDirector Lite, a scaled-down version of its NetDirector network management system aimed at remote offices or departmental networks with fewer than 125 nodes.

NetDirector Lite runs on an OS/2-based personal computer and can be used as either a stand-alone management system or domain manager controlled by a full NetDirector.

NetDirector Lite software will be available this month for $4,500. A version preinstalled on a Dell Computer Corp. PC will be available in October. Pricing is not yet available.

For more information, contact UB at (800) 777-4526.

Strategic Networks Consulting, Inc. (SNCI), a consultancy in Rockland, Mass., last week announced its newest report, "Internetworking SNA: A Survivor's Guide."

The $1,500 report is intended to help users with the technical and strategic aspects of merging local-area network internets with IBM Systems Network Architecture nets. For more information, contact SNCI at (617) 871-5195.

Cabletron Systems, Inc. last week announced a reseller agreement whereby Northern Telecom, Inc. will resell Cabletron's intelligent hubs,

(continued on page 16)

Cameo introduces two-port Ethernet bridge module

UltraHub 5000 card supports Spanning Tree spec.

By Skip MacAskill
Staff Writer

NASHUA, N.H. — Start-up Cameo Communications, Inc. last week rolled out a two-port Ethernet bridge module for its UltraHub 5000 line of intelligent hubs.

The new AH 320-02 is a media access control (MAC)-layer bridge card for the UltraHub 5000 that is compliant with the IEEE 802.3 and 802.1D Spanning Tree Protocols. It has a self-learning function that enables it to identify local addresses and forward only packets destined for remote locations.

The module's maximum filtering rate is 10K packet/sec, and it can forward up to 5K packet/sec, based on 64-byte packets. Aggregate throughput was not available at press time.

The AH 320-02 is also hot-swappable, meaning users can remove or install it without affecting other modules sitting in the UltraHub's 12-slot chassis. As many as three AH 320-02 modules may be used in the UltraHub 5000.

> As many as three AH 320-02 modules may be used in the UltraHub 5000.
>
> ▲▲▲

The module comes equipped with four status and diagnostic LEDs for each port, indicating transmit, receive, blocking and disable/enable.

The bridge module also has 64K bytes of battery-powered

(continued on page 16)

Cisco unveils flashy lower end routers

By Maureen Molloy
Senior Writer

MENLO PARK, Calif. — Cisco Systems, Inc. last week announced a series of low-end multiprotocol routers that employ Flash EPROMs to ease router deployment in remote locations.

With the new Cisco 3000, the vendor becomes the latest to offer Flash erasable programmable read-only memory (EPROM) capabilities to enable users to download software configurations and upgrades from a central site.

Proteon, Inc. two weeks ago announced the same feature on a new line of low-end routers ("Proteon bridge/router eases remote site deployment," *NW*, July 27), as Flash memory is increasingly becoming a standard feature rather than an option on remote bridge/routers.

Previously, low-end devices were configured using more cumbersome PROM chips or by booting from local floppy disks.

The Cisco 3000 is available in three configurations: a two-port local Ethernet bridge/router priced at $5,495; another with one Ethernet and one synchronous serial port for $5,795; and a third with one token ring and one serial port priced at $6,995. Both serial ports support speeds up to 4M bit/sec. All three will be available in October.

The devices support the same protocols and local- and wide-area network interfaces as Cisco's higher end MGS and AGS+ bridge/routers. They also have memory that can be expanded from the standard 4M bytes to 16M bytes. Future versions of the Cisco 3000 will support an Integrated Services Digital Network Basic Rate Interface.

In addition, Cisco announced price cuts of as much as 20% for its existing low-end IGS bridge/routers, which have limited expansion capabilities and no Flash memory. The two-Ethernet version has been reduced from $4,995 to $3,995; the Ethernet/serial version from $5,495 to $4,295; and the token-ring/serial version from $6,995 to $5,495.

The price cuts are effective immediately. ◻

> ATM is a compelling approach that will reduce the overall market size for FDDI.
>
> ▲▲▲
>
> **Rob Held**
> President and CEO
> Chipcom Corp.

Chipcom CEO offers glimpse into future

Discusses plans for FDDI over copper and his company's long-term strategy to support ATM.

Q&A Successfully adapting to rapidly changing user needs is becoming more difficult for vendors of internetworking equipment, but Chipcom Corp., an intelligent hub maker based in Southborough, Mass., has managed to excel in this environment, posting record sales and net income for the second quarter ended June 27.

Network World Staff Writer Skip MacAskill recently spoke with Chipcom President and Chief Executive Officer Rob Held about such topics as Chipcom's support for a Fiber Distributed Data Interface-over-copper standard and the company's long-term Asynchronous Transfer Mode (ATM) strategy.

How has Chipcom carved out its spot in the marketplace?

When everyone else was concentrating on the work group, we came into the market at the facility level, which is why our product line ended up being different.

Our customers then started hooking facilities together and buying at the division level. Now they're buying more enterprise-wide solutions.

Where does Chipcom stand on the FDDI-over-copper issue?

There are times to be competitive and times to be a statesman, and we see ourselves in this issue as a statesman.

The real money in copper FDDI will probably be made by chip vendors, not by hub vendors. It's an opportunity to get the market to grow if we can agree on a standard. We'll be happy to back the standard; we don't have a proprietary interest in how it fleshes out.

Will FDDI suffer as ATM-based products emerge?

We think very strongly that ATM is a compelling approach that will reduce the overall market size for FDDI. FDDI will become a more specialized capability. It certainly won't go away, but it will not be this huge market that people expected it to be for two reasons. At the low end, there are all sorts of creative solutions that allow users to avoid the expense of moving up to FDDI. At the high end, they'll buy ATM before FDDI is really, truly finished and implemented all over the place.

> The real money in copper FDDI will probably be made by chip vendors.
>
> ▲▲▲

What will Chipcom's ATM strategy be?

It's really too early to say what we're doing, but we certainly have an active program, which will support ATM as customer ap-

(continued on page 16)

Chipcom CEO offers glimpse into future

continued from page 15

plications show up in the marketplace. It is clear that we can't allow the products customers are buying now to be obviated by ATM. That's the critical question we're working on now, and it's more important than having ATM.

What is Chipcom planning for release in the fourth quarter of this year or early 1993?

We have more token-ring and FDDI products coming, as well as significant enhancements in the Ethernet market, and you'll see more in the net management area. It's pretty much a straight-ahead tack but a 'more and better' kind of approach in the second half.

What long-term strategies are you developing to maintain your growth and success?

We have to be extremely flexible and comprehensive in terms of the packages we offer customers so they have lots of options. That includes inexpensive connections as well as state-of-the-art whiz-bang stuff because the customer wants both. The demand is getting more complex, so the product offerings have to follow suit.

These solutions, however, are growing beyond the bounds of what one company can do. That's why you'll see increasing numbers of partnerships, alliances and allegiances.

Our strategy is to build alliances with companies that have pieces of technology that we don't have and who want technology we have.

We also want to work within channels that are trying to put the whole solution together. We don't see ourselves as that channel. We've always sold through systems integrators for that reason.

Shortly after this interview, Chipcom announced a joint development and marketing alliance with IBM that will focus on switching hubs ("IBM partners with Chipcom to enhance LAN hub line," NW, *July 27).*

Cameo intros 2-port E-net bridge module

continued from page 15

random-access memory, which stores configuration information in the event of a power outage.

The module can be connected to any two of the four Ethernet channels within the UltraHub 5000 concentrator. The hub has a four-channel architecture called QuadChannel, which can support four independent 10M bit/sec Ethernets ("Start-up Cameo introduces low-cost Ethernet hub line," *NW,* April 20).

The AH 320-02, which is priced at about $1,000 per port, can also connect any two Ethernet channels in separate UltraHub 5000s.

UltraView upgrades

In addition to the AH 320-02 rollout, Cameo has added out-of-band management features to its UltraView net management system, supporting management of remote devices via a modem connection in the event of a line failure.

UltraView has also been enhanced to perform real-time monitoring of the bridge module and provide statistics on bridge traffic. The net management software can gather network information at user-defined intervals and offers the option of setting thresholds and Simple Network Management Protocol traps to find net problems such as a malfunctioning module.

The AH 320-02 bridge card is available now.

Link Notes

continued from page 15

adapter cards and network management systems throughout Europe and North America.

Teleos Communications, Inc. has announced a premise wiring device to extend the reach of its NetworkHub and VideoHub products. Called HubExtender, the device can transport signals up to 4,000 feet in a campus environment, thereby eliminating the need for more expensive V.35 cabling, which is limited in distance to 50 feet, the firm said.

According to Teleos, HubExtender will save customers 40% on line installation charges and 50% to 90% on ongoing line charges over competing videoconferencing and imaging network products.

HubExtender, which consists of two modules, is priced at $1,250 per module and is available now.

Power Tools

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```
    DATE  |CNT|           ALARM DESCRIPTION                          |   LOCATION
 P  11/02 |1  |MODEM OUT OF SERVICE                                   |CABINET 3-HDQ
 U  11/02 |1  |ALL MUX BOARDS DOWN   *** CHECK POWER SUPPLY ***       |Mux*Loc2
 U  11/02 |4  |BIT ERROR RATE ABOVE THRESHOLD                         |Location*1
 U  11/02 |1  |BOARD DOWN                                             |Mux*Loc2
 U  11/02 |1  |BOARD DOWN                                             |Mux*Loc2
 U  11/02 |1  |BOARD DOWN                                             |Mux*Loc2
 A  11/02 |2  |BIT ERROR RATE ABOVE THRESHOLD                         |Mux*DC
 U
```

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GLOBAL SERVICES

DOMESTIC AND INTERNATIONAL VOICE/DATA SERVICES, ACCESS EQUIPMENT AND REGULATORY ISSUES

Worth Noting

"The idea of having carriers use the intelligence in their networks to offer things like automatic call distribution is a wonderful idea. Carriers are looking for every opportunity to offer advanced network-based services to users."

Bill Church
President
Call Center Solutions
Florham, N.J.

Regulatory Update

The **Federal Communications Commission** last week turned down a Freedom of Information Act (FOIA) request from **Allnet Communication Services, Inc.**, which sought access to data contained in the Bell operating companies' switching cost information system (SCIS).

SCIS is a computer model developed by Bell Communications Research that is used by the Bell companies to justify the cost support data they submit to the FCC for their Open Network Architecture implementation plans.

The commission last week concluded that "public disclosure of the SCIS model would result in substantial competitive harm to the carriers." The decision upholds the common carrier decision of last February to reject Allnet's FOIA request, which Allnet then appealed to the full commission.

The FCC recently allowed changes AT&T filed to modify rate charges and number of service locations available under Tariff 58 to go into effect over the objections of several resellers.

Metromedia rolls out new long-haul calling services

Says ExactCall line offers more flexible pricing.

By Bob Wallace
Senior Editor

EAST RUTHERFORD, N.J. — Metromedia Communications Corp. has announced a family of inbound and outbound long-distance calling services it says are more flexibly priced than those of the Big Three carriers.

Unlike calling plans offered by AT&T, MCI Communications Corp. and Sprint Corp., Metromedia's ExactCall line of services are offered at a flat rate, carry no monthly fees or usage minimums, and discounts are applied to total usage of each service.

ExactCall services include a basic interstate long-distance offering, a WATS product, inbound and outbound 800 services and a calling card offering, all targeted at small and midsize firms. With its Automatic Customized Discount plan, users pay less for inbound and outbound calls made to and from the most frequently called interstate area codes and international locations.

Calling plans offered by the Big Three to small and midsize businesses limit special (nonvolume) discounts to specific telephone numbers or to one or two interstate area codes. Metromedia's plan applies a discount to all calls made to and from as many as five interstate area codes and two international locations.

But analysts say the toughest challenge smaller carriers like Metromedia face is marketing.

"AT&T, MCI and Sprint have spent a good deal of money on marketing," said Bob Self, president of Market Dynamics, a tariff analysis firm in New York. "Metromedia doesn't have the same service recognition but needs it if these services are to succeed."

ExactCall services are billed in six-second increments.

With ExactCall Plus and ExactCall WATS, users pay one rate for calls up to 124 miles and a second rate for calls beyond that limit. ExactCall Plus calls to the most called area codes range from $0.1706 to $0.1440 per minute for the 0-124 mileage band and $0.2025 to $0.1710 per minute

(continued on page 18)

RBHC set to offer frame relay service in Kansas

By Anita Taff
Washington Bureau Chief

KANSAS CITY, Kan. — Southwestern Bell Corp. was given the green light to begin offering frame relay service in Kansas, the first state in which the carrier has received regulatory approval to proceed with the high-speed data service.

Frame relay will be offered initially in Kansas City, but it will be rolled out in Topeka and Wichita by year end. Company officials said the service will reduce prices and increase flexibility for users.

Tom Zurheide, district manager for business product management at Southwestern Bell, said that in some configurations, frame relay service could be half as expensive as a private-line net.

For example, a customer could tie together five sites in a metropolitan area over 56K bit/sec frame relay lines for $1,300 per month, compared to $2,600 for the same locations tied together in a fully meshed private-line network, he explained. The frame relay configuration uses five links compared to eight in the private-line configuration.

According to a spokesman for the regional Bell holding company, Southwestern Bell submitted several proposals to users for frame relay, but as of last week, none had signed up. The company expects customers to use the service for applications such as local-area network interconnection, remote database access, imaging, and sharing of computer-aided design and manufacturing files.

The service comprises Site Link, a dedicated line that ties the customer site to the carrier's central office, and Logical Link, a permanent virtual circuit that links customer locations.

Both Site Link and Logical

(continued on page 18)

SMDS vs. frame relay

	Switched Multimegabit Data Service	Frame relay
Area served	Potentially nationwide	Potentially nationwide
Service type	Connectionless	Connection-oriented
Standard	Complex	Simpler
Availability	Emerging in 1992/1993	Available now
Standard definition	Full definition	Includes options
Frame type	Fixed cells	Variable

SOURCE: LEONARD KLEINROCK, CHAIRMAN, THE TECHNOLOGY TRANSFER INSTITUTE, LOS ANGELES

GRAPHIC BY SUSAN J. CHAMPENY

Critics knock frame relay's usefulness

Conference panel expresses preference for SMDS over frame relay, but others disagree.

By Ellen Messmer
Washington Correspondent

WASHINGTON, D.C. — Frame relay recently came under heavy fire by a panel of specialists from the industry and academia during a conference on high-speed networking here.

At the Gigabit Networks conference, speakers said the packet network technology offers limited flow control and high latency, and lacks a means to link independent frame relay nets. But members of the Frame Relay Forum have rushed to the technology's defense, saying the critics did not take into account developments in the works.

One of the speakers critical of frame relay was Leonard Kleinrock, professor of computer sciences at the University of California, Los Angeles and chairman of the Technology Transfer Institute.

Kleinrock said that, although frame relay supports dynamic bandwidth allocation and statistical multiplexing useful for connecting local-area networks, it has a maximum speed of 2M bit/sec and lacks a standard for network-layer function, requiring vendors to implement it in a proprietary manner. In essence, it supports virtual private connections.

In contrast, Switched Multimegabit Data Service (SMDS) — which is only available on a limited basis — has fixed-length cells, works at T-1 to 45M bit/sec speeds and potentially higher, and could become a high-speed public switched data service.

"SMDS has it all over frame relay," said Kleinrock, although he was careful to point out that the two new data services differ in their fundamentals.

Kleinrock said frame relay's variable-length frame design is less efficient than the fixed-cell length design of SMDS and Asynchronous Transfer Mode (ATM). "Frame relay is to cell relay what store-and-forward message switching is to packet switching," Kleinrock said, adding that SMDS has a lower error rate and a better packet-delivery rate than frame relay.

Kleinrock concluded that frame relay offers little advantage over a well-designed X.25 network in most situations because frame relay does not offer the interoperability available through X.25.

But Tom Jones, chairman of the Frame Relay Forum and vice-president of marketing at Microdyne Corp., countered several of Kleinrock's claims. "There's a myth that there's a limit of 2M bit/sec on frame relay," Jones said, emphasizing that members of the forum are confident that the technology will be able to meet user needs to at least 50M bit/sec.

Jones also said the forum next month expects to approve an implementor's agreement for a frame relay network-to-network interface, an important step toward ensuring network interoperability. "We fully expect all frame relay services to be interoperable," he emphasized.

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Pack lets users manage desktops

continued from page 11

such as OpenView, are designed to filter out a lot of unwanted data, he said.

Memory problem solved

Another potential problem is chewing up too much memory on the desktop computers, Johnson said. 3Com has addressed that by designing its software to run on the adapter card rather than in background on the PC, he said. Also, the SNMP intelligence is on the SoftHub/NLM server, which typically has more memory than desktop computers.

LinkWatch requires from 1K to 3K bytes of memory on NetWare client nodes and less than 6K bytes on NDIS nodes. That compares to between 20K and 80K bytes for some other solutions, according to 3Com.

LinkWatch will work with 3Com's EtherLink II, EtherLink II/16, EtherLink 16, EtherLink/MC and EtherLink/MC 32 series adapters as well as all future 3Com Ethernet adapters, including a forthcoming line based on the company's own application-specific integrated circuit chips.

Down the road, 3Com will look to enhance LinkWatch by making it available for other network operating systems, such as Banyan Systems, Inc. VINES and Microsoft Corp.'s LAN Manager, Johnson said. While there may be opportunities to extend the product to support token-ring and Fiber Distributed Data Interface nets, 3Com is focusing initially on supporting its installed base of some 4.5 million Ethernet adapter cards, he added.

LinkWatch is available now and is priced at $395 per license, which is for one server installation and can support up to 251 nodes.

Show 'n' tell no longer kid's play

continued from page 11

whose machine the original document and application reside can access the application running in background and make the changes to the original file.

For example, if the group noticed a discrepancy in a spreadsheet, ShowMe's active window would let a user make changes to the spreadsheet, recalculate the result and repaste the spreadsheet with new results to the ShowMe white board without ever exiting the ShowMe conference or pushing it entirely into the background.

"Another program might take four or five steps to do that," said Byron Ryono, director and general manager of SunSolutions. "With active window, you just click, make the changes [in the application] and click again to update those changes to the [white board]."

"When we show this to people, some of the comments we've received on this product is, 'Wow, this is just like the Mac,' and we take that as quite a compliment," Walden said.

The program is based on Unix System Laboratories, Inc.'s OpenLook graphical user interface. Because it uses the Sun Solaris operating system's built-in Remote Procedure Call technology, ShowMe does not require a central store-and-forward server. Instead, it runs at each user's machine and keeps other users in the group updated through distributed commands.

The SunSolutions software is scheduled to ship by year end and will cost $349 for a single license and $2,870 for any 10 concurrent users on the network.

Compaq to rev up power

continued from page 11

66 Processor Board Upgrade for the Compaq SystemPro/LT, includes a 256K-byte second-level cache, which helps provide better performance, even though the system can only house one of the new boards.

Differentiation

Compaq plans to differentiate itself from competitors that will also use the new Intel microprocessor — such as Advanced Logic Research and Everex — based on the added features the company offers.

"We generally offer a higher performing I/O subsystem with our [Intelligent Drive Array-2] controller," Hornstein said. The IDA-2 is an upgradable controller that offers a 4M-byte buffer to speed server writes to the drive array.

Hornstein added that Compaq also offers over 20G bytes of expansion storage and Redundant Array of Inexpensive Disks-5 capabilities on the IDA-2 controllers.

New desktops

In conjunction with the new SystemPro boards, Compaq this week will also bring out two new DeskPro models that the company says will have enough power to be used as servers.

The DeskPro 66M delivers performance up to 35% faster than existing 50-MHz 486DX2-based machines, according to the company, while the new, lower end DeskPro 4/66i is being touted as a Windows PC, or one that would best be used to run Microsoft Corp. Windows applications in either a client or server configuration.

Like existing DeskPro models, both new DeskPro/M machines are modular, enabling customers to upgrade to even higher end microprocessors, for example, as they become available.

Compaq is also making available a 486DX2/66 Processor Board Upgrade Kit for all current Compaq DeskPro/M users, letting them upgrade to the new microprocessor without buying a completely new machine.

The 486DX2/66 System Processor Board for the SystemPro is available now and ranges in price from $2,649 to $2,999, depending on the machine being upgraded. The processor board upgrades for both the SystemPro LT and existing DeskPro/M models are also available now and range in price from $729 to $2,179.

The new DeskPro models range in price from $2,749 to $5,199, depending on the model.

RBHC to offer frame relay

continued from page 17

Link are priced on a monthly flat-rate basis. Pricing for Site Link includes a monthly fee and a one-time installation charge per line.

For instance, a 56K bit/sec Site Link costs $170 per month and carries a $345 installation charge for the first line and $270 per line for each additional line. A 384K bit/sec Site Link costs $295 per month and carries an installation charge of $525 for the first line and $365 for each additional line. A T-1 Site Link costs $850 per month, plus $525 for installation for the first line and $365 for each added line.

Pricing for a Logical Link also includes a monthly flat-rate charge and a onetime installation charge. The service costs $45 per month for a 56K bit/sec Logical Link, $60 per month for a 384K bit/sec link and $160 per month for a T-1 speed line. Users also pay installation charges of $165 for the first line and $130 for each additional line.

Southwestern Bell is following several other RBHCs in rolling out frame relay service. Nynex Corp. and US West, Inc. have rolled out frame relay, while the other four RBHCs are scheduled to offer frame relay service late this year or early next year.

Critics knock frame relay

continued from page 17

He disagreed that frame relay plays second fiddle to X.25. "Frame relay requires less processing power and is more economical in terms of what you pay for switches and routers in many applications, particularly LANs," Jones said, noting that Frame Relay is a Layer 2 link-level protocol.

Frame relay's variable-length frames mean it fits well with the variable-length packets used in TCP/IP, OSI and DECnet. "You don't have to take it and chop it into cells," Jones said. "It deals with data in the condition it's in." Frame relay is not a technology for gigabit networking nor is it for voice and video because of the delay, but it can meet users' current needs for LAN interconnection, Jones said.

Fixed-cell ATM is an exciting technology for very high speeds, Jones said, but he added, "There's a crossover point where it becomes worthwhile in terms of the cost of the switch and the equipment to convert the data into fixed-cell lengths."

ATM looms on horizon

ATM is taking on the quality of the Holy Grail for very high speed networking. A fixed-cell connectionless service supporting speeds of 155M bit/sec, 622M bit/sec and higher, it offers the potential to integrate video, voice and data. ATM has been evaluated to have very low latency, which is the time it takes to propagate bits from point to point across a net.

NetExpress, Inc., which is manufacturing an ATM switch to be released by year end, claims it tested frame relay for latency and found it took 60 msec for frame relay bits to be transferred across a five-node network spanning 700 miles. SMDS and ATM did considerably better. SMDS and ATM at T-1 speeds showed about 0.3 msec latency, and only half of that when tested at T-3 speeds.

Lawrence Roberts, chairman and chief executive officer of NetExpress, Inc., said, "Delay variation is important for speech and video, and every other interactive application you can think of. You've got to have ATM or Fiber Distributed Data Interface for multimedia. Frame relay has too much delay."

"ATM has a diverse set of functionalities defined in it," said Ronald Toth, product manager of AT&T business services. But he noted that ATM standards for user network interfaces are still under development, saying, "It's still early, and each implementation will be the manufacturer's best guess of where the standard is going."

How current network protocols such as TCP/IP will function in an unprecedented high-speed environment was also a subject of debate at the conference. "If you run TCP/IP over ATM, efficiency goes down 40%," said Henry Sinnreich, executive staff engineer at MCI Communications Corp. "And if you run frame relay and SMDS over ATM cells, you have another order of efficiency problem, and you have to add the two."

The question of whether new "lightweight" network protocols will have to be developed for ATM was also open to debate.

Firm rolls out calling services

continued from page 17

for calls beyond that. Calls to all other area codes range from $0.1895 to $0.1630 per minute for calls in the 0-124 mileage band and $0.2250 to $0.1935 per minute for calls beyond that.

Calls to most called area codes are discounted 10% to 24%, and calls to all other area codes are cut as much as 14%. Discounts are determined by monthly usage.

ExactCall WATS calls to most called area codes range from $0.1103 to $0.0907 per minute for the 0-124 mileage band and $0.1395 to $0.1147 per minute for other calls. Calls to other area codes range from $0.1225 to $0.1029 per minute for the band and $0.1550 to $0.1302 per minute for other calls.

ExactCall WATS calls to most called area codes are discounted 10% to 26%, while calls to all other area codes are lowered as much as 16%, with discounts based on monthly usage.

Users pay a onetime mileage-independent rate for each of the other ExactCall services — ExactCall 800, ExactCall 800 WATS and ExactCall Card. ExactCall 800 calls to most called area codes are discounted up to 21% for more than $2,000 in monthly usage, while calls to all other area codes are discounted up to 11% for usage beyond that level.

ExactCall 800 WATS calls from several top area codes are discounted 10% to 25%, depending on monthly usage, while calls from all other area codes are discounted up to 15%.

ExactCall Card calls to popular area codes are discounted 10% to 23%.

ExactCall services are available now.

ENTERPRISE APPLICATIONS

CLIENT/SERVER AND ENABLING SOFTWARE: DISTRIBUTED DATABASE, MESSAGING, GROUPWARE AND IMAGING

Worth Noting

> "On a scale from 1 to 10, I would give vendors a 7 for effort and a 3 for results when it comes to developing tools for managing client/server environments."
>
> **B.J. Choi**
> Vice-president
> J.P. Morgan & Company, Inc.
> New York

Store & Forward

Vinzant, Inc. has released Version 1.10 of its local-area network-based job scheduling product called Event Control Server. The client/server software enables users to automatically run jobs, such as automatic backups and file checks, on DOS and OS/2 machines in Novell, Inc. NetWare, IBM LAN Server and Microsoft Corp. LAN Manager networks.

The new version allows users to prescribe times during the day when certain jobs should not run and reschedule other jobs for specific dates in the future.

The software costs $995 for a single-site server license and $4,995 for a multisite server license.

PeerLogic, Inc. of San Francisco has announced the availability of Version 3.1 of its Pipes Platform — a distributed application environment that supports multiple platforms and protocols — for Sun Microsystems, Inc.'s SunOS. With the new release for the Sun operating system, developers will now be able to use Pipes Platform to build distributed applications that can run on IBM's OS/2 or AIX and Novell, Inc.'s NetWare.

Pipes Platform Version 3.1 is available now and costs $685 per node.

J.P. Morgan sets client/server agenda

Bank defines 20 management topics to address

Support
- Change management
- Problem management
- Operational support
- Software testing

Organization
- Chargebacks
- Information systems skills
- Training
- Client/server user group

Methodology
- Selecting client/server applications
- Project planning
- Application development guidelines
- Distributed database design
- Deployment of global applications
- Contingency planning
- Downsizing mainframe applications

Architecture
- Network infrastructure
- Management tools
- Software development repository
- Database
- Security

SOURCE: J.P. MORGAN & COMPANY, INC., NEW YORK
GRAPHIC BY SUSAN J. CHAMPENY

Sybase draws Gain Tech under corporate umbrella

Move boosts database firm's object capabilities.

By Timothy O'Brien
West Coast Bureau Chief

EMERYVILLE, Calif. — Sybase, Inc. and Gain Technology, Inc., a vendor of object-based multimedia application development tools, have signed an agreement under which Gain will become a wholly owned subsidiary of Sybase.

Under the terms of the agreement, Sybase will issue approximately two million shares of common stock valued at roughly $61 million in exchange for all outstanding shares of Gain common stock and options.

According to Stewart Schuster, Sybase's vice-president of marketing, the decision to merge with Gain was based on Sybase's desire to keep pace with rapid developments in multimedia and object technology, along with the realization that it would have taken Sybase several years to accomplish what Gain has achieved.

"Through this merger, Sybase offers an object-oriented [fourth-generation language] that provides support for multimedia in client/server application development and includes an interface to SQL," Schuster said.

Sybase, known for being a leader in client/server relational database technology, provides a range of products that allow the development of on-line applications. With Gain's products, Sybase now has new market opportunities since it can combine object-oriented multimedia tools with its popular database server.

Gain, founded in 1989, markets GainMomentum, a multimedia application development environment, and GainExposure, a tool for building Unix-based demonstration software. These products just began shipping this year.

GainMomentum, which is built on top of an object-oriented database, provides an interactive user interface that takes advantage of multimedia and graphics capabilities. It also features an object-oriented fourth-generation language that supports code-free programming driven through prompts or icons on the screen.

GainMomentum products are currently available in 12 languages for Sun Microsystems, Inc. Unix workstations.

Schuster said the merger fits with Sybase's strategy to offer a range of tools to meet its customers' varied requirements. He said Sybase will position the Gain products as front-end tools that coexist with its back-end SQL relational database technology.

"Gain's underlying object-oriented database has a fundamentally different foundation and characteristics from an SQL database such as SQL Server. Tools should provide the bridge for coexistence," Schuster explained.

For the foreseeable future, Gain, headquartered in Palo Alto, Calif., will operate as a separate company and retain its name.

User wrestles with client/server mgmt.

J.P. Morgan takes innovative tack to managing new distributed applications on a global basis.

By Wayne Eckerson
Senior Editor

NEW YORK — Like many large decentralized companies, J.P. Morgan & Company, Inc. is scrambling to figure out how to manage a burgeoning number of client/server applications in a consistent, reliable and cost-effective manner.

While only a few departments at J.P. Morgan have deployed client/server applications so far, a dozen or more applications are under development, some that will support mission-critical banking operations.

That has J.P. Morgan's information systems (IS) department worried because there are almost no commercially available tools or established practices for managing and supporting client/server applications on a global basis. Moreover, the rise of client/server computing is forcing the bank, which has relied heavily on mainframe processing, to reassess its network strategy, internal operating procedures and methodologies for designing applications and databases.

"Until now, our approach to managing client/server applications has been ad hoc, which is fine when there are only a small number of applications but not when there is an explosion of them," said Dennis Pease, managing director of J.P. Morgan's applications tools group. "We decided to step back and figure out what we need to do to ensure that client/server applications are given the same level of support as mainframe applications."

B.J. Choi, a vice-president of network services, admits that the bank has no easy solutions to the problem of managing client/server applications but said it is a step ahead of many other companies because it has defined the issues it needs to address.

This spring, a group of volunteers in the corporate IS department interviewed key network and systems managers in various areas of the bank about client/server issues.

The survey showed a surprising consistency in the issues posed by client/server computing but a divergence in the approaches to them. Overall, the bank defined 20 issues to be addressed (see graphic, this page).

The topics were grouped into four categories: architecture, methodology, organization and support. Topics in the support category, for example, include change and problem management and procedures for testing new client/server applications.

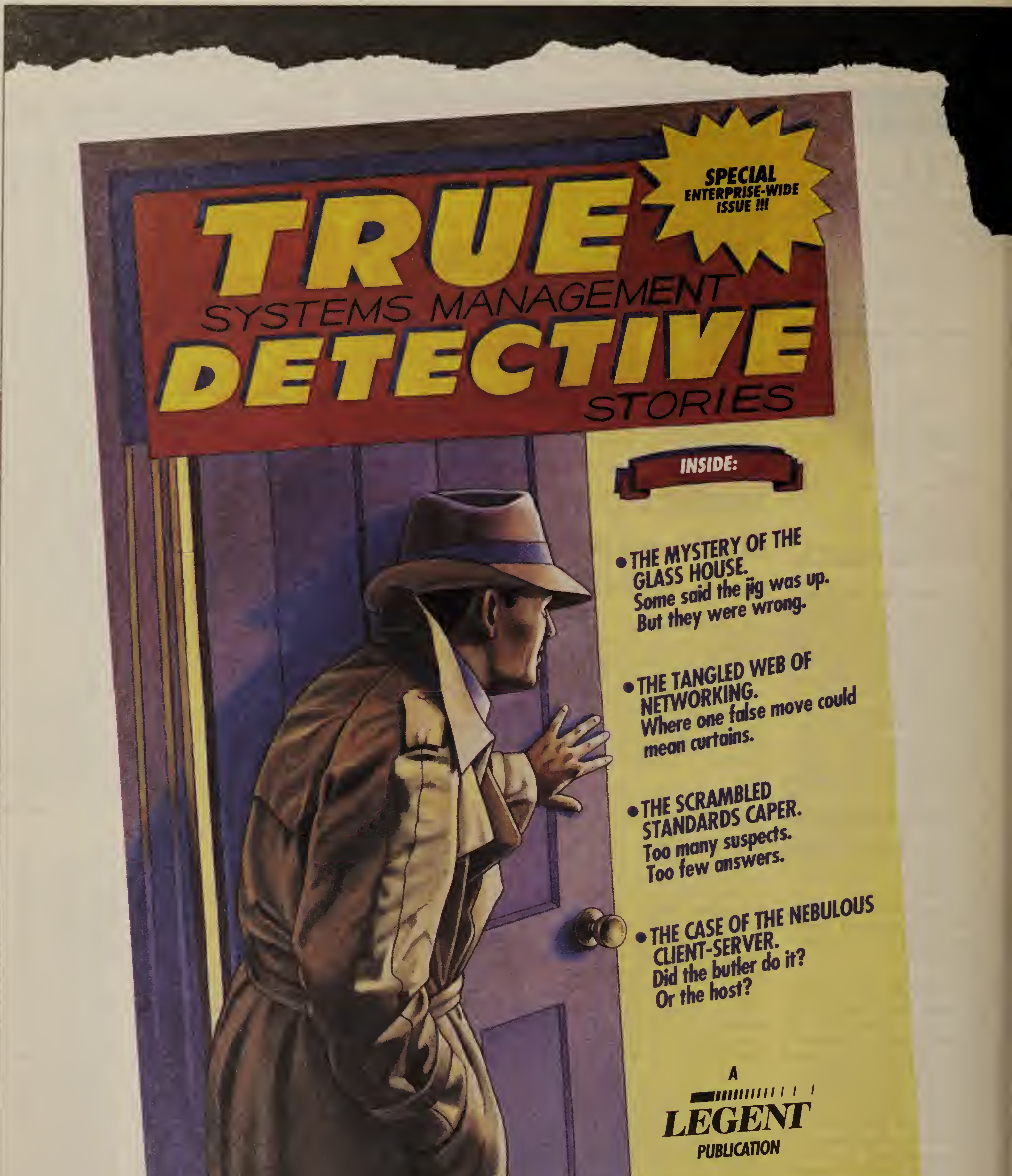
The ad hoc IS group then ranked the issues according to importance and formulated three approaches to them. The group last week presented its recommendations to senior managers in the bank's Global Technology and Operations division and is waiting for a reply.

> There are almost no tools for supporting client/server applications on a global basis.
>
> ▲▲▲

One approach is to outsource the management of client/server applications to a third party. Another is to focus on developing capabilities in two critical areas: networking and production support, which includes problem and change management.

The last approach, which carries the team's strongest recommendation, is to tackle the top nine issues on the list, even if the bank doesn't have the resources to implement a comprehensive solution for each. The top nine issues have the best potential of reducing risk of downtime for the least amount of money, Choi said. These include production support, network strategy, security and contingency planning.

"If we can get people going in a consistent direction, even if it's ultimately not the right direction, it will be easier to get them in step when there is a more defined approach to handling client/server issues," Pease said.



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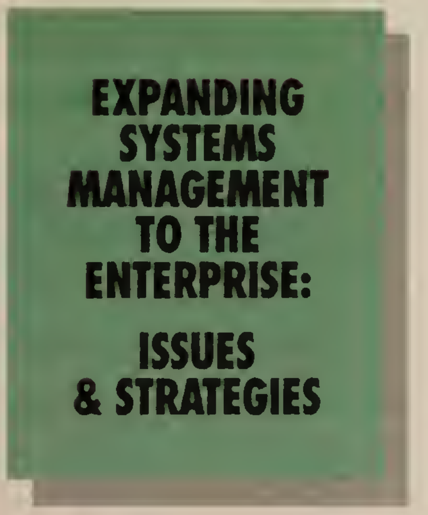

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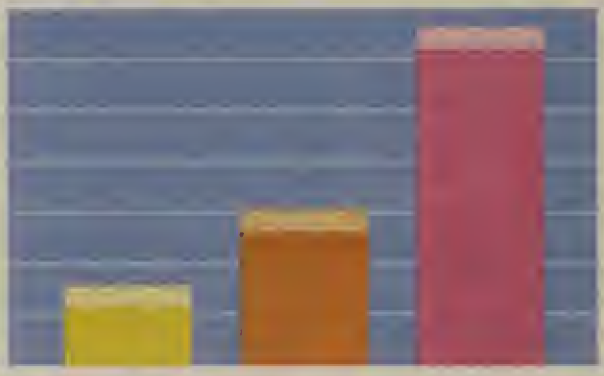

NETWORK SAVINGS

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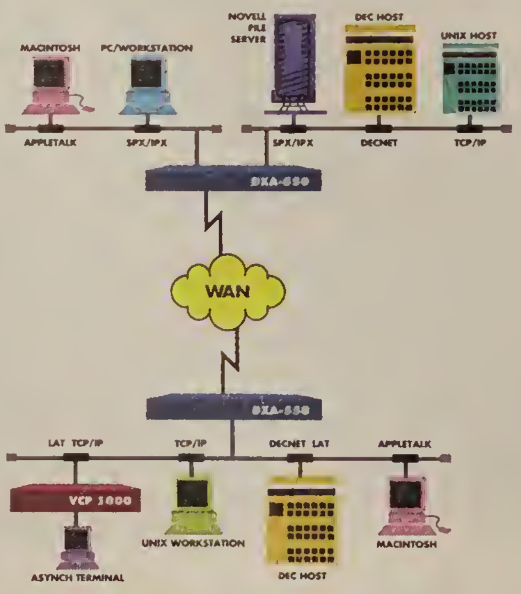

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Worth Noting

CrossComm Corp., a Marlborough, Mass., router vendor, last week announced a joint development and marketing partnership with General DataComm, Inc. of Middlebury, Conn., under which the two firms plan to build internetworking gear for voice, data, video and image traffic.

People & Positions

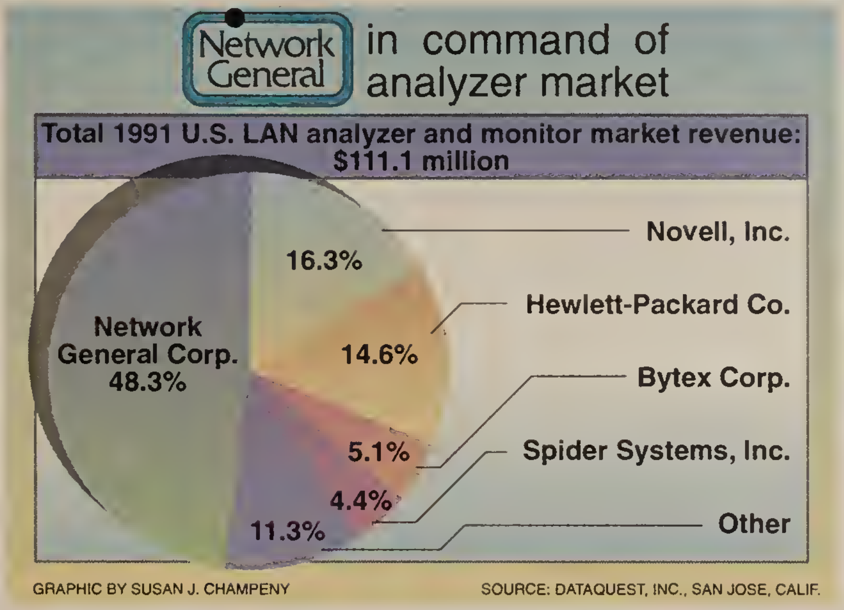
Anura Guruge recently left his post as the lead consultant at **BBN Communications** in Cambridge, Mass., to become a strategic consultant at large.

Guruge, who frequently writes for *Network World,* specializes in internetworking as well as IBM's Systems Network Architecture, Advanced Peer-to-Peer Networking and SystemView.

He can be reached at (603) 878-1303.

Gandalf Technologies, Inc. has promoted **Alexander Brisbourne**, formerly director of international marketing operations, to the newly created position of vice-president of marketing strategy. In his new role, Brisbourne will be responsible for developing Gandalf's long-term product and business marketing strategy.

Gandalf has also appointed **George Best**, formerly president and chief executive officer of Worldtel Telecommunications Corp., to the position of vice-president of sales and marketing for Gandalf Data, Ltd., the company's research and manufacturing subsidiary. ☐



GRAPHIC BY SUSAN J. CHAMPENY

SOURCE: DATAQUEST, INC., SAN JOSE, CALIF.

Network General looking to rebound from bad 1Q

Hopes to increase its Distributed Sniffer sales.

By Bob Brown
Senior Editor

MENLO PARK, Calif. — Coming off a disappointing first quarter for fiscal 1993, Network General Corp. officials aren't surprised to find industry watchers sniffing around for problems at the market-leading LAN analyzer firm.

Wall Street early last month blasted Network General, which sells the portable Sniffer and Distributed Sniffer System network analyzers, when the company announced that revenue would come up short of expectations in the quarter ended June 30. In one day, Network General's stock plunged from $18 to about $9 a share.

Network General posted first-quarter revenue of $15.5 million, up 19% from the first quarter last year but down 18.6% from the previous quarter. Earnings dropped 34%, from $1.7 million in the first quarter last year to $1.1 million this quarter.

The company blamed the earnings shortfall on the lower than expected revenue. The revenue was off for several reasons, chief among them a transition on the sales side of the house, said Harry Saal, Network General's president and chief executive officer.

Distributed Sniffer

Beginning last April, Network General increased its emphasis on selling the high-end Distributed Sniffer System, a product that has a longer sales cycle than the company's flagship Sniffer. Unlike the portable Sniffer, which is carried from site to site, the Distributed Sniffer System resides on the network and can be operated remotely.

"When selling the Distributed Sniffer, you could be looking at a contract in the hundred thousands of dollars or even millions of dollars over a period of years, and you're talking to top executives," Saal said. "That's opposed to selling a $10,000 or $20,000 portable device to a lower level network engineer."

Network General generated about 20% of its sales last year from the Distributed Sniffer System and is looking to increase that share significantly, Saal said.

Despite the slow start this fiscal year, Saal said he believes Network General's fundamental business strategy and position remain solid.

The company has $80 million in cash on hand and no debt. It also has introduced a new set of products, including an expert system version of the Sniffer, that should begin contributing revenue going forward.

And despite increased competition from established network industry players, such as Hewlett-Packard Co. and Novell, Inc., Network General continues to own about half of the LAN analyzer and monitor market (see graphic, this page).

"I think what you saw [on Wall Street] was a violent reaction to a single number, which is earnings per share. They tend to forget about all of the other things that are really going to build the future," Saal said.

(continued on page 26)

Optics consortium to benefit ATM effort

Research into optoelectronics may aid deployment of new transmission technologies, other initiatives.

By Ellen Messmer
Washington Correspondent

WASHINGTON, D.C. — The consortium that AT&T, IBM, General Electric Co. and Honeywell, Inc. recently created to research optoelectronic switching at gigabit speeds may be critical to the deployment of Asynchronous Transfer Mode (ATM) transmission technology.

The Optoelectronic Technology Consortium (OETC) intends to test data transmission over an eight-node test-bed net operating at 16G bit/sec. Research results are expected to benefit a wide range of disciplines, including computer systems and networks.

One potential beneficiary is ATM, a multiplexing standard for networks operating at speeds of 155M bit/sec and up.

Henry Sinnreich, executive staff engineer at MCI Communications Corp., said photonic switching appears to be preferable to electronic switching for ATM. "We need to avoid silicon — electronics are slow," Sinnreich said during the recent Gigabit Networks conference here (see "Critics knock frame relay's usefulness," page 17).

Optoelectonic technology is beginning to be recognized as a good way to transition to ATM, agreed Phil Anthony, head of the optoelectronics devices department at AT&T Bell Laboratories, which will set up the test bed at a GE site in Syracuse, N.Y. "This type of technology will make ATM work better."

Electronic and photonic switching technologies are essentially interoperable and unlikely to pose migration problems to users, Anthony said. "Optical switches simply offer greater bandwidth," he said.

"We're using light, or photons, instead of electronics," Anthony said. "Electrons suffer problems in propagation, but

(continued on page 26)

NET FINANCIALS

Network Equipment Technologies, Inc. (NET) reported first-quarter revenue of $51.4 million for the period ended June 28, up about 33% from revenue of $38.5 million in the first quarter last year. Earnings rose from a loss of $984,000 in the corresponding quarter last year to a profit of $1.6 million this quarter.

Daniel Warmenhoven, chairman and chief executive officer of NET, projected that the company's financial results will be flat or possibly decrease in the second quarter due to softness in the economy. However, he said the company expects its financials for the year to be much better than those of last year.

Retix, a vendor of Open Systems Interconnection and messaging software, reported revenue of $17.5 million for its second quarter ended June 27, up 18% from $14.9 million posted in the second quarter last year. Earnings for the quarter increased to $1.8 million, up 92% from the $951,000 for the comparable period in 1991. Steve Frankel, president and chief executive officer, said the results reflect growth in the company's end-user products, which have served to balance the company's traditional OEM and core software businesses.

StrataCom, Inc., a San Jose, Calif., fast packet switch maker, reported second-quarter revenue of $13 million for the period ended June 30, up 30% over revenue of $10 million for the second quarter of 1991. Earnings were $1 million for the quarter, a major increase over the $13,000 reported for the second quarter last year. StrataCom made an initial public offering July 21. ☐

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IBM

Company looking to rebound

continued from page 23

The stock free-fall was not a first for Network General. In 1990, the company's stock plummeted from about $12 a share to $4 for a short period after the firm yanked its low-end Watchdog product off shelves because they weren't selling, Saal said.

Analysts views on Network General are mixed.

"Network General's business fell apart in the June quarter, and it's not totally clear what happened," said Steve Levy, an analyst at the New York office of brokerage firm Hambrecht & Quist. "But the company's fundamentals and products are excellent, so I expect a rebound."

Questioning strategy

Tom Erickson, an analyst at Wessels, Arnold & Henderson, a brokerage firm in Minneapolis, questioned Network General's business strategy.

"Network General has the best protocol analysis software on the market today," he wrote in a recent report.

"Unfortunately, the company has chosen to deliver the software on [proprietary] hardware platforms. A more appropriate strategy would be to adopt a software-only business model and focus on continuing to develop the best protocol analysis software package available," the report stated.

Saal said he thinks of Network General as a software company already, even though the company bundles its software with adapter cards.

Developing software for generic adapter cards would severely cut down on the performance of Network General's software, he said. ◘

Optics research to benefit ATM

continued from page 23

photons travel with less loss. When you communicate optically, you don't have to worry about the impedance of the line, or noise or cross talk between the lines. A lot of those problems are in the electronics."

But optical technology faces basic problems that need to be solved. It depends on surface-emitting lasers to generate optical signals, but this equipment is subject to overheating when used to generate high-speed signals, Anthony said. He also pointed out that no one has ever demonstrated an operating 16G bit/sec capacity system, and several system components will have to be built by the partners in the project.

> "By the second half of the decade, we will see optics in switching."
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Honeywell's role will be to create a common laser power supply, GE will deliver the integrated circuits, and IBM will supply the detector array to detect light and convert it into an electronic signal. AT&T will develop the surface-emitting laser transmitter. The parts will be integrated by GE, which will oversee the project.

The Defense Advanced Research Projects Agency (DARPA) has awarded OETC $8 million in funding over 30 months to prepare the test bed. When completed, it will consist of eight nodes connected by 32 parallel fiber-optic links each transmitting data at 500M bit/sec for a maximum 16G bit/sec speed.

Information culled from the effort to build the prototype will be shared with a user group that includes Intel Corp., Cray Research, Inc. and Network Systems Corp. Researchers from universities and government laboratories have also been invited to participate in the project or evaluate the results.

The basic research behind the DARPA-funded project is likely to lead to the next generation of AT&T switching systems, Anthony said. "By the second half of the decade, we will see optics in switching," he predicted, adding that the OETC test bed will help Intel design their next systems. "The Intel people are interested in seeing what people can do with processors at high speeds." ◘

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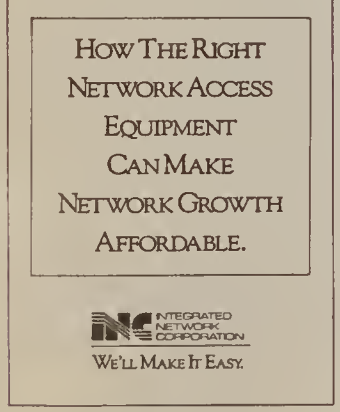
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Worth Noting

"We've got to [support] interenterprise networking. You can't tell a company they have to buy a Wellfleet or a Cisco router because that's what you're using. Everything has to interoperate."

Lisa Lennon
Product manager
Pacific Bell
San Francisco

Manager Minutes

The **UniForum Association** and **EurOpen** have announced keynote speakers for OpenForum 92, the first Pan-European open systems conference and exhibition.

The conference, which will be held in Utrecht, Netherlands, on Nov. 25-27, will include technical sessions, as well as business and strategy sessions that focus on building open systems-based networks.

Separately, UniForum announced it is issuing a call for entries for its 1993 UniForum Products Directory, a comprehensive vendor-independent source for Unix and open systems products and services.

The 1992 edition of the products directory includes more than 7,600 products and services from at least 2,100 vendors. The directory lists applications and their descriptions, as well as the environments and platforms on which they run, according to UniForum.

The directory is free to UniForum members, and nonmembers can purchase a copy for $95.

For more information, call UniForum at (800) 255-5620.

Banks spend big, but slow to use new technologies

Security, cutbacks reasons for moving cautiously.

By Bob Brown
Senior Editor

Although banks are among the biggest spenders on information technology, many financial institutions have been slow to install local-area networks and adopt other advanced network technology, according to a new study.

The "1992 Technology Survey," conducted by *American Banker,* a daily newspaper covering the banking industry, and Ernst & Young, found that a little more than a third of bank microcomputers are networked. And even though banks are sinking so much money into technology, they are at best at the same stage as most other industries when it comes to implementing groupware and other emerging client/server applications.

The survey concluded that banks are moving ahead cautiously for several reasons. These include commitment to their installed base of computers, security concerns, budget cutbacks and an industrywide consolidation.

The survey was based on interviews with chief information officers and other information technology representatives at 68 of the largest U.S. banks.

The banks spent a total of $14.1 billion on technology last year, up by about 2% from the $13.8 million plowed into technology in 1990.

Banks surveyed had a total of 766,000 microcomputers, an increase from 644,000 last year. But only 37% of the bank locations have LANs, and most of those are used for customer service and other applications that are not mission-critical, such as money transfers, according to Greg Schmergel, a consultant at the Ernst & Young Center for Information Technology and Strategy in Boston.

That figure is expected to double over the next three years, respondents said.

Only one-tenth of a percent of host-based applications have been downsized to LANs so far, said Diogo Teixeira, a partner at Ernst & Young.

Survey respondents also reported very low use (7%) of standard network protocols, such as the Transmission Control Proto-

(continued on page 42)

EXECUTIVE BRIEFS

It's only a movie — or is it? Commonwealth Films, Inc. has released two educational videos, one designed to show employees the importance of a good disaster recovery plan and the other demonstrating how companies can ensure they don't violate software licensing agreements.

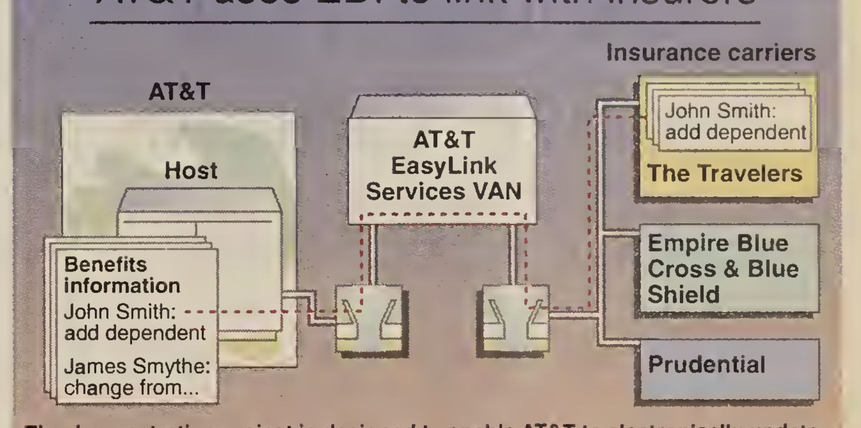
The videos, which Commonwealth Films terms "corporate horror," use dramatized events and special effects to convey their points.

The first video, titled "Back in Business: Disaster Recovery/Business Resumption," details how one company's flawed disaster recovery plan almost led to its demise during a local disaster. The video looks at everyday emergencies such as power failures and water damage, as well as major disasters such as earthquakes. It also covers data processing recovery, recovery of critical records on paper and other media, the backup process, off-site storage, salvage operations and security, and retails for $475.

The second video, titled "We Lost Control: Illegal Software Duplication," shows employees how to protect their organization and themselves from software licensing violations. By using dramatic vignettes to outline licensing agreement rules for software duplication, the video demonstrates how to avoid copyright violations, some of which could lead to stiff criminal fines as high as $350,000. "We Lost Control" is also priced at $475.

For more information, call Commonwealth Films at (617) 266-6150.

AT&T uses EDI to link with insurers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Host
Benefits information
John Smith: add dependent
James Smythe: change from...
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John Smith: add dependent
The Travelers
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Prudential

The demonstration project is designed to enable AT&T to electronically update employee benefits enrollment information with all 3 of its insurance providers, The Travelers Insurance Co., Empire Blue Cross & Blue Shield and The Prudential Insurance Co. of America, via the EasyLink value-added network (VAN).

GRAPHIC BY SUSAN J. CHAMPENY SOURCE: THE WORKGROUP FOR EDI, WASHINGTON, D.C.

EDI proponents sign up AT&T for demo

Workgroup for EDI coalition hopes to show that the technology can save users time and money.

By Joanne Cummings
Senior Writer

WASHINGTON, D.C. — By 1994, AT&T will be utilizing electronic data interchange to send employee insurance benefits information to its three insurance carriers, eliminating the costly and time-consuming process of updating the insurers via computer tapes.

The move to EDI is part of a demonstration project sponsored by the Workgroup for EDI (WEDI), a coalition of private and public health care providers that is urging the industrywide adoption of EDI prior to 1996 ("Health care providers put forth plan to spur EDI use," *NW,* July 27).

According to Lee Barrett, director of information systems at Travelers Insurance Co. and a WEDI staff member, the demonstration project will prove to the industry that EDI is viable and can save time and money.

"The industry has been waiting for the technology to be there," Barrett said. "We're saying the technology is there now."

He said insurance carriers today are apprised monthly of insurance changes via shipments of computer tapes. "If an employee terminates [employment] on the third day of the month, for example, the insurance carrier may not realize it until it receives the tape at the end of the month," Barrett said. "The employee will be receiving benefits for an extra 27 days or so, and that's costly."

In addition, changes in status, such as adding a dependent to an employee's insurance to cover the birth of a baby, may not be acknowledged by the carrier until it receives the updated tape at the end of the month.

The project, which is currently in the test phase, takes advantage of the 834 ANSI X12 enrollment transaction, a standard EDI transaction for sharing benefits information between employers and insurers.

Once fully implemented by AT&T, the firm will be able to download employee benefits information from its mainframe-based payroll application via a gateway to a mailbox in the AT&T EasyLink value-added network.

The three insurers, The Travelers Insurance Co., Empire Blue Cross & Blue Shield and The Prudential Insurance Co. of America, can then use their claims systems to access the mailbox, also through a gateway, at predetermined intervals.

"What we want to do is move initially to a monthly electronic data interchange between all three insurers and AT&T," Barrett said. "But eventually, we will migrate to a biweekly and, potentially, a daily feed." Daily exchanges would eliminate any coverage problems, he said, because changes could be updated almost immediately.

Barrett said the AT&T pilot is one of many that WEDI hopes to implement in the next year or so.

OPINIONS

TCP/IP

BY DAVID CRAWFORD

Vendors now realize value of TCP/IP suite

How do you spell relief for the headaches of multiprotocol networking? T-C-P-I-P.

The typical enterprise network is an awkward conglomeration of Apple Computer, Inc. Macintoshes, Digital Equipment Corp. minicomputers, IBM Personal Computers and compatibles, IBM mainframes, and Unix workstations and file servers running Novell, Inc.'s NetWare. Today, Transmission Control Protocol/Internet Protocol is the only networking scheme that can provide complete connectivity for all of these devices.

TCP/IP's governmental origin helps explain its success. The protocol's designers weren't biased by the interests of any particular hardware or software vendor, so they created a generalized set of networking tools that could be implemented on any computer.

> Each proprietary vendor saw networking only in relation to its own market niche.
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> ▲▲▲

Each proprietary vendor, on the other hand, saw networking only in relation to its own market niche. IBM saw networking as a way to connect dumb terminals to a mainframe. Apple envisioned networking as a way for Macintoshes to share a laser printer. To DEC, networking was for clustering the computing resources of several mid-range computers. And Novell viewed networking as a chance for PC users to share a hard disk. None of these companies foresaw that networks would expand beyond the individual departments of a company and beyond the walls of an individual enterprise to become global in scope.

These companies' narrow vision of networking, however, has come back to haunt them. All have had difficulty making their protocols interoperate with those of other vendors in an increasingly mixed computing environment. Once they realized their customers wanted to build nets larger than they had ever imagined, these companies had to make ad hoc modifications, such as IBM's extended subarea addressing and Apple's AppleTalk Phase 2, to expand the scale of their protocols.

Because TCP/IP provides a ready-made solution to the problem of communication between incompatible systems and allows almost unlimited wide-area network growth, it now seems attractive to these vendors. Both IBM and DEC are selling TCP/IP packages as officially supported alternatives to their proprietary protocols. Apple has MacTCP. Novell offers NetWare Loadable Modules for TCP/IP routing and for access to its file servers via Sun Microsystems, Inc.'s Network File System, a de facto standard built on top of TCP/IP.

And all the vendors have realized that there's no future for a network management tool that is specific to one company's proprietary protocol. By now, almost all network management products are based on the Simple Network Management Protocol, which had its origins in the TCP/IP arena.

We've been conditioned to assume that private industry will plan and design more intelligently than the federal government. The success of TCP/IP offers a notable counterexample. It's encouraging to see, especially in an election year, that every once in a while the government does something right. ◘

Crawford is network coordinator at California State University in Northridge, Calif.

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EDITORIAL

There's more to high-speed services than meets the eye

Network managers contemplating a move to emerging high-speed transmission services had better take a close look not only at the technical ramifications, but also at their carriers' commitment to the technology.

Carriers speaking at a recent conference in Washington, D.C. made it clear that their support for frame relay, Switched Multimegabit Data Service (SMDS) and Asynchronous Transfer Mode (ATM) is uncertain at best.

Both local and long-haul carriers have waffled over defining specific applications for ATM, frame relay and SMDS. For carriers, technical hurdles are secondary to the larger question of which technology to support since they don't have enough capital to invest in all of them.

The SMDS Interest Group, which largely represents carriers and equipment vendors, has said timing is of the essence when it comes to making SMDS service available. With most internetworks expected to be deployed within the next two years, SMDS must be available if it's to compete with frame relay and ATM for internetwork dollars, the group says.

Users also need to ask themselves whether they really need ATM, frame relay and SMDS. With ATM looming on the horizon, users are — understandably — reluctant to invest now in equipment that supports frame relay or SMDS. Those needing the high bandwidth of frame relay or SMDS today must be assured the services are not obsoleted by ATM.

Some carriers, such as MCI Communications Corp., have expressed disappointment over user demand for frame relay, which MCI said has amounted to only about a $20 million market for all the carriers this year.

The fact is that carriers are driving the deployment of high-speed services based on their own revenue-generating strategies and not market demand.

To counter this, users should press carriers to make long-term commitments to a high-speed offering, with penalties if service levels slip. That way, users can rest easy, knowing that a service will be viable long after the carrier shifts to another technology. ◘

DBMS UPDATE

BY RICHARD FINKELSTEIN

Tried-and-true tools are the best bet for distributing data

In most organizations, data can be found distributed across multiple personal computers, workstations, network file servers, minicomputers and mainframes. But that data may not be accessible to the applications that need it. To overcome this problem, net managers have several viable alternatives, including the use of client/server applications, data extract tools and remote procedure calls (RPC).

Surely, net managers can use distributed relational databases such as Ingres/Star from ASK Computer Systems, Inc.'s Ingres Product Division, Oracle Corp.'s Oracle*Star and Informix Software, Inc.'s Informix/Star. The objective of these products is to make data stored in multiple sites appear as if it were a single local database. These products are designed to enable a user to retrieve data from different computers with a single query.

While such distributed relational database management systems have been around for a long time, they are really still in an embryonic stage and risky because they push the envelope of current technology to its limits. They are also very expensive to deploy and administer.

To function as promised, distributed relational DBMSs must ensure the integrity of data distributed across multiple sites and guarantee rapid response time to queries that involve retrieval of data from multiple sites. However, there is no evidence to date that these products achieve practical transparent access to distributed databases.

There will probably not be any major breakthrough in this area in the next few years. Instead, the technology will most likely get incrementally better.

The more mature and workable solutions include consolidating information in a client/server environment, using specialized data extract software and accessing remote databases using remote procedure calls.

With the client/server approach, data is stored in a centralized microcomputer- or minicomputer-based SQL database server. Users with different types of applications share access to that common database over a local-area network.

With such a setup, users can develop customized applications or use off-the-shelf software to access a single, centralized and consistent copy of data that is always up-to-date. The database server contains integrity features, which ensure files are restored to their previous state should an update fail and control access to certain files.

Distributed relational DBMSs have been around for a long time but are still risky.

▲▲▲

While the client/server approach works well on LANs, there is still a large amount of data on mainframes. Because they are costly and generally tuned for existing mission-critical applications, mainframes are not as good a database server platform as minicomputers or microcomputers.

One way to solve this problem is to use data extract software to copy databases from mainframes into LAN database servers. This technique allows users to easily access data for reporting and analysis, and frees the mainframe from these duties. Some data extract tools enable users to perform a batch update of the mainframe database by transmitting all the changes made to the copied data at once.

This data extract approach provides many of the benefits of client/server computing with a minimum amount of risk or investment. Data extract software is relatively inexpensive and is a proven technology. The downside to this approach is that the data on the database server must be refreshed periodically. With very large databases, users could wind up spending more time and money updating the copied data than it's worth.

Applications that require users to have immediate access to remote data provide a perfect situation for using RPCs, which enable a local workstation to transparently execute transactions on a remote computer. For example, an order-entry transaction executing on a workstation can issue an RPC that accesses a remote host and returns inventory information to the workstation.

RPCs have many advantages. They execute on the remote mainframe just like any other transaction. RPCs can also be designed to access any type of mainframe data source — whether it's a relational database such as IBM's DB2, a hierarchical database such as IBM's IMS or indexed files such as IBM's VSAM.

These three distributed data solutions are practical and have been widely implemented. For the time being, it is best to stay within the boundaries of these tried and true solutions.

Finkelstein is president of Performance Computing, Inc., a consulting company in Chicago that focuses on client/server and rightsizing applications.

TELETOONS

BY FRANK AND TROISE

EXTREMELY LOCAL-AREA NETWORK.

LETTERS

Disputing the facts

I am shocked and dismayed by your article "FTS 2000 contract charges under fire," (*NW*, July 20). It reads like an unedited press release emanating from the MCI Communications Corp.-WilTel coalition. It recites all the untruths and half-truths that coalition is disseminating in its propaganda. Its objective is to derail the federal procurement process and the FTS 2000 contract in particular.

Your paper asked AT&T to comment on the study. We did, meeting your deadline despite having the study less than a day, and you chose not to use the information we provided. Here are some of the flaws we identified based on our initial analysis.

First, contrary to what the study concludes, AT&T does pass discounts it has realized in local access on to its customers.

Second, WilTel's study draws its T-3 price comparisons using mileage bands that overstate actual FTS 2000 network transport rates, which are calculated by city pairs. This methodology distorts the comparison.

Finally, WilTel's study manufactures data for pricing comparisons in future years. In fact, real future pricing wasn't used.

Upon further analysis, we determined that the study's comparison of Contract Tariff 14 (what your article calls AT&T's 14th contract deal) and FTS 2000 is the consummate apples-to-oranges view because Contract Tariff 14 is an offer that is restricted to approved common carriers and provides interoffice channel service only, not premises-to-premises service.

(continued on page 42)

Do you disagree with an article you've read in Network World? *Write us a letter about it.*

Hard copy should be typed, double spaced and mailed to Editor, Network World, *161 Worcester Road, Framingham, Mass. 01701 or faxed to (508) 820-3467. If you prefer, letters can be sent via MCI Mail at 390-4868 or uploaded to our Bulletin Board System. (See page 2 for BBS instructions.)*

Letters may be edited for space and clarity.

ATTENTION VENDORS OF PBX-TO-HOST APPLICATIONS: Network World would like to list your product in a Buyer's Guide being published Sept. 21. This Buyer's Guide will cover the critical buying criteria and current market trends for PBX-to-host applications and computer/telephone integration products.

To obtain a survey form, call Charles Bruno, features editor, at (508) 820-7414 or Marc Robins at (212) 614-9842. We must receive your request for a survey form by Friday, Aug. 14.

If you were building the bank of the future, which premises wiring system would you invest in?

NationsBank chose AMP.

NationsBank is the fourth-largest banking company in the U.S. One telling measure of that size shows up in their network, where their remarkable growth over the last decade has had people changing offices or computer equipment at a move-and-change rate significantly above average for the industry.

So when they planned their new 60-story office complex in Charlotte – the tallest building between New York City and Dallas – NationsBank knew exactly what they needed in a premises wiring system: something that could cope with a great deal of change. They found just what the banker ordered, in the AMP NETCONNECT Open Wiring System.

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Circle Reader Service #108

AMP Access Floor Workstation Modules and AMP Communications Outlets give NationsBank freedom from obsolescence, allowing moves and changes in seconds.

Sixteen floors of the new building, the key operations areas, were designated for raised floor construction and fitted with AMP Access Floor Workstation Modules and AMP Communications Outlets. the bank's custom cabling (one branch STP, two branches UTP, bonded into a single cable) is permanently terminated to the outlets, and changes are accomplished with a simple insert exchange. The inserts, available for all major equipment, provide a true "wire-once" solution, and reduce move-and-change time to minutes.

The floor modules tilt up for direct access to power (isolated ground and standard outlets for each workstation), and to the communications outlets. The modules are located on the corners of floor tiles, which can be rotated to adjust for furniture and workstation position. The modules can also be relocated 10 feet in any direction, to accommodate changes in floor layout.

The result for NationsBank is a premises wiring system that gives them total flexibility in moves and changes – and the speed they need to maintain both their strong customer focus…and their phenomenal growth.

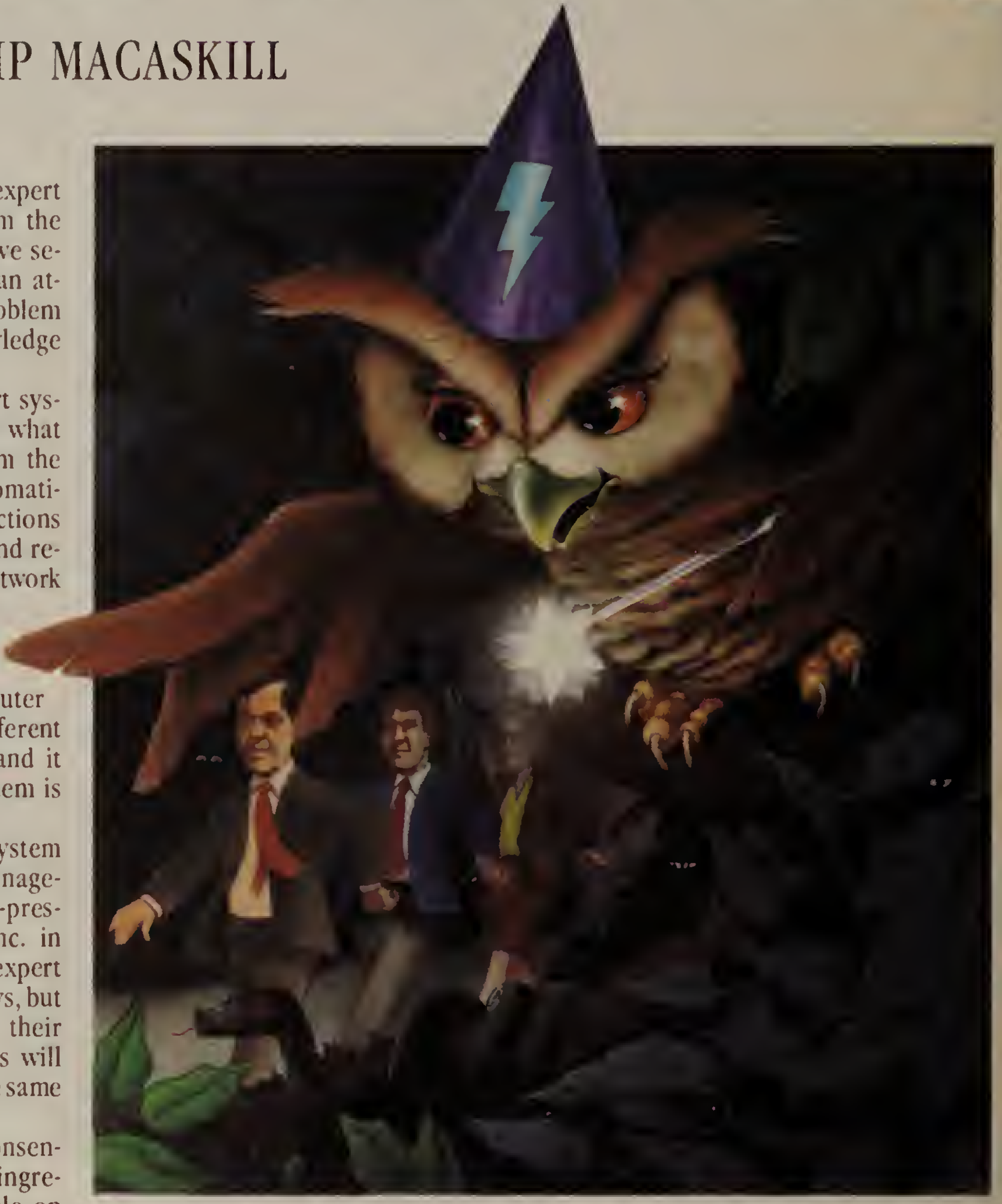
For more information about the AMP NETCONNECT Open Wiring System, call 1-800-522-6752 (fax 717-968-7575). AMP Incorporated, Harrisburg, PA 17105-3608. In Canada, call 416-475-6222.

THIS IS AMP TODAY.

AMP

Management tools offer

By SKIP MACASKILL



To many users, troubleshooting networks must seem like traversing a dark forest: they must sidestep obstacles, build up defenses and reroute traffic around faulty paths as they go along. What would help, they say, is a bit of advice from a networking sage or even the wave of a magical wand that would lead them safely out of the forest.

This may sound like they are wishing for the moon since there is no such cure-all for network problems. But net managers can rely on some things to ease their management chores.

For instance, vendors are producing expert system tools that gather information about network problems or performance, compare it against stored knowledge and present users with likely causes for the problems or poor performance, along with suggested fixes. These tools often include capabilities that can choose the best fix and automatically implement it.

Some vendors, such as Hewlett-Packard Co. and Novell, Inc., are producing stand-alone expert systems that include hardware and software for local-area network monitoring and repair. Others, such as AT&T, Digital Equipment Corp. and IBM, are layering increasingly sophisticated expert system software on top of their integrated net management products.

These expert systems and automation capabilities can have a tremendous effect on network management. With them, a net manager can automate routine and often mundane tasks, freeing highly skilled staff to work on preventing problems, customizing net management, tracking net performance, reducing staff and, eventually, going to a "lights-out" management approach where the net could theoretically run itself.

At the core of these expert systems is a knowledge base, which is a database containing bits of information such as historical network problems, the status of network devices at the time the problem occurred and the steps taken to rectify it. Vendors typically poll their technical staff to build at least a rudimentary knowledge base that users can tap into as soon as they install the expert system. Many expert systems enable users to continuously expand that knowledge base with information garnered from their own experts.

When a problem surfaces, an expert system gathers information from the network and uses a comprehensive sequence of if-then statements in an attempt to discover if a similar problem has been chronicled in the knowledge base.

If a match is found, the expert system can inform the net manager what was done to resolve the problem the last time it occurred or it can automatically trigger the series of functions needed to resolve the problem and report the intervention to the network manager.

Expert system components

Like many things in the computer industry, expert systems have different meanings for different people, and it appears that the true expert system is still a creature of the future.

"There is not a pure expert system out there today for network management," says John McConnell, vice-president of Infonetics Research, Inc. in Boulder, Colo. Sophisticated expert systems may well be in use, he says, but their users are reluctant to extol their virtues for fear that competitors will employ the technology to gain the same advantage.

There is, however, a general consensus on what constitutes the basic ingredients of expert systems available on the market today.

"An expert system, which is more accurately a knowledge-based system, has three components," says Steve McClure, a senior consultant at International Data Corp., a market research firm in Framingham, Mass. "It includes a user interface, the part of the software that actually carries on the dialogue with the user; a knowledge base, which is a database that has a set of user-defined rules and a model of the network domain; and an inference engine, which [allows the system to interact with the knowledge base]."

By positioning the expert system correctly, net managers can unchain themselves from the tedious and time-consuming task of monitoring a series of net management consoles in the data center and concentrate on improving the performance of the network and planning for future innovation.

While the ultimate goal may be a lights-out approach to management, the current reality involves finding solutions that can automate as many routine procedures as possible.

"Our direction is to automate as many things as possible that are redundant and predictable in resolution," says Jerry Hosler, systems manager for the network management and software division of Caterpillar, Inc. in East Peoria, Ill. "Although [a lights-out management approach] would be a panacea, I don't think it's achievable at this point due to the multitude of element management systems that exist."

The expert system would be required to work with every one of those element managers, Hosler says. "We would be interested in that, however, if it were possible," he added.

Jeff Case, president of SNMP Research, Inc. in Knoxville, Tenn., agrees. "I'd like to see the day when a network management station can detect a problem, diagnose it, do a fault bypass to get that part of the network back up and then report what it did to the net administrator," he says. "That's not part of the management station today, but it's coming."

Customization counts

In the meantime, users are looking for expert systems they can customize to meet their particular needs. Vendors are responding with expert systems that allow the user to tailor the product to the needs of the network.

Of an expert system's three portions, the knowledge base is the most vital to the user because that is where customization comes into play. In order for an expert system to be truly effec-

ILLUSTRATION ©1992 STEVE MOSCOWITZ

expert advice

Customizable and smarter than ever, expert systems can guide users through a forest of network problems.

tive, it must have access to a knowledge base that is tailored to the specific components of the network. By customizing this knowledge base, the user provides the expert system with the network information needed to diagnose and resolve error conditions specific to a particular net.

Most vendors offer some customization options in their expert system offerings. IBM's NetView, for example, has some built-in flexibility that allows users to customize the knowledge base.

"We take our experts, build a default rules file, ship that out to the customer and say, 'Look, here's what IBM would do when faced with X, Y or Z,' " says Pat Donleycott, manager of network and systems management solutions for IBM. "We then give them a programmer's cookbook that will help them get their experts together to tailor the default rules file if they want."

In order to make that process easier for the user, IBM has moved away from Command List (CList), a control language used to write script shells for interactive management applications, and has embraced its Restructured Executive External (REXX) language.

"We're using REXX now because customers find it easier to program and the language is a bit more powerful than CList," Donleycott says.

With either language, users can write code that will automate a routine procedure. Instead of going through a procedure that requires a long string of keystrokes, the user can simply initiate a CList or REXX command that will automatically perform those keystrokes at the appropriate time. The CList or REXX intervention may also be initiated automatically if the user configures it to do so.

Demand for automation

Users are clamoring for such automation in expert system products. A break in a logical session between two network devices, for example, can trigger hundreds, sometimes thousands, of alarms from a number of devices used to establish that session. Managers want an expert system that can filter through those alarms, arrive at the root of the problem and resolve it.

According to a June critical network issues study by Infonetics Research, net managers ranked more automation as the No. 1 function they would like to see in next-generation management tools.

Accumaster Integrator, AT&T's net management system, has this automation function. It enables the user to input prewritten script files into the knowledge base that can trip a response when certain alarms or conditions exist. That response can include filtering the alarms, diagnosing the root of the problem and initiating or offering resolution procedures.

Dennis Biedrzycki, marketing manager of Network Application Support Systems Management for the Software Products Group of Digital Equipment Corp., sees total automation of the enterprise as the net manager's vision of the future.

"We're moving toward automation across the board and looking at DEC Management Control Center Director [DEC's integrated net management platform] as taking steps to what we think of as the ultimate goal — a self-managing information environment," he says. "We believe that is where most managers would like to be today."

Expert systems can:

- Reduce net management staff
- Automate routine tasks
- Customize net management
- Track net performance
- Allow administrator to focus on improving the net and initiating future innovation

GRAPHIC BY TERRI MITCHELL

As a short-term goal, it's clear that users want these types of automation capabilities built into their net management systems, and most vendors strive to automate as many procedures as possible.

"We've tried to translate those types of things into understandable English and give the operator a true feel for what the problem is," says Brett Coley, a staff programmer for IBM. "In a sense, we have made it easier for the man on the street to come in and run the network."

Others, however, don't buy the idea that if vendors pour more automation features into their net management systems, any warm body can be transformed into an effective network manager.

"One of the problems today is this myth that you can take a $1,000 PC clone, a $295 software package and someone who doesn't know anything about networks and turn him into a network manager," SNMP Research's Case says. "There are people who actually believe that nonsense. You really need to know something about networks in order to manage them."

Peter Goldstein, network systems manager for EAC Connecting Point, a systems integrator in Bridgefield, Conn., agrees.

"In the types of situations we're in, you still need to understand what's going on because we use expert systems as a tool to get us through the drudgery work," he says. "You read a lot about expert systems that says you can bring the higher end of troubleshooting down to people who have less training. I don't completely agree with that."

Tracking net performance

For systems integrators such as Goldstein, the main value of an expert system is often its ability to compile historical information and track the network's performance via net auditing features.

EAC Connecting Point, for example, recently invested about $50,000 in HP's Network Advisor, an expert system-based protocol analyzer, in order to streamline field operations.

"What we're finding with expert systems, like Network Advisor, is what was taking us an entire day to do — such as build a snapshot of what a client [network] looked like — is now done in a half hour," Goldstein says.

Network Advisor maintains net statistics for both Ethernet and token-ring networks through its Summary Statistics feature. The product automatically maintains tables of network performance conditions, such as the number of purges, soft errors, protocols in use and network utilization, and presents the information to the user in gauges on the screen that look like those on a car's dashboard.

The product's Fault Finder feature can then take that information and act on it, depending on how the user configures the system. Fault Finder has a measurement function that collects net performance data and automatically defines typical operating characteristics. These baseline figures can be used as a standard for comparison and a basis for managing a variety of network parameters.

According to Ted Haller, product manager for Network Advisor, many of the problems that Fault Finder will point to are based on some type of hardware or configuration problem.

Key components for an expert system

- User interface, which provides user input
- Knowledge base, which is a database containing user-defined rules and a network model
- Inference engine, which allows system to access knowledge base

GRAPHIC BY TERRI MITCHELL

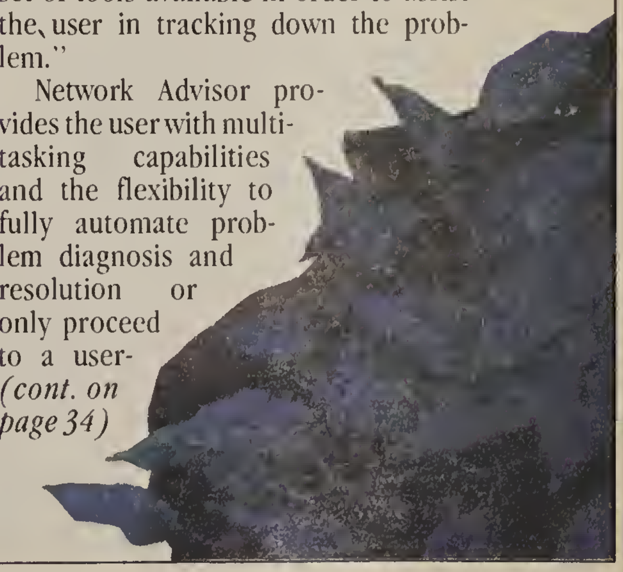
"Typically, about 80% of the management problems today are physically oriented or configuration problems, and those are fairly easy to troubleshoot with a rules-based approach," he says. "Physical problems tend to affect the network the same way most of the time. Configuration and protocol issues are really not that tough to track down either, if you know what to look for. A good expert system will go out and do that for you."

For problems that fall outside of that category, the expert system should make some indication of which path to take, Haller says.

"The expert system should be able to at least point the user in the right direction to resolve the problems it couldn't handle," he says. "The vendor, then, must back up that system with the best set of tools available in order to assist the user in tracking down the problem."

Network Advisor provides the user with multitasking capabilities and the flexibility to fully automate problem diagnosis and resolution or only proceed to a user-

(cont. on page 34)



(continued from page 33)

defined level before requiring human intervention.

"Network Advisor will run several different response tests at the same time and do an exhaustive search," Haller says. "It won't just give you a list of 10 possible causes of a problem and tell you to go out and find the right one. It'll actually try to prove or disprove everything it has hypothesized."

This high degree of automation can help the user streamline operations and become more efficient.

"We can go right in and start working on the customer's problem because of the time we save with Network Advisor," Goldstein says. "We may not be billing that 7½ hours of additional revenue, but we're providing better service to the client and generating more business opportunities because we can fix problems more quickly."

Reducing staff

The streamlining benefit that expert systems can generate is also helping some users cut overhead costs via staff reductions.

"Automation has probably given us the luxury of decreasing our net management staff by 30%," Caterpillar's Hosler says. "At the same time, we've improved availability of services."

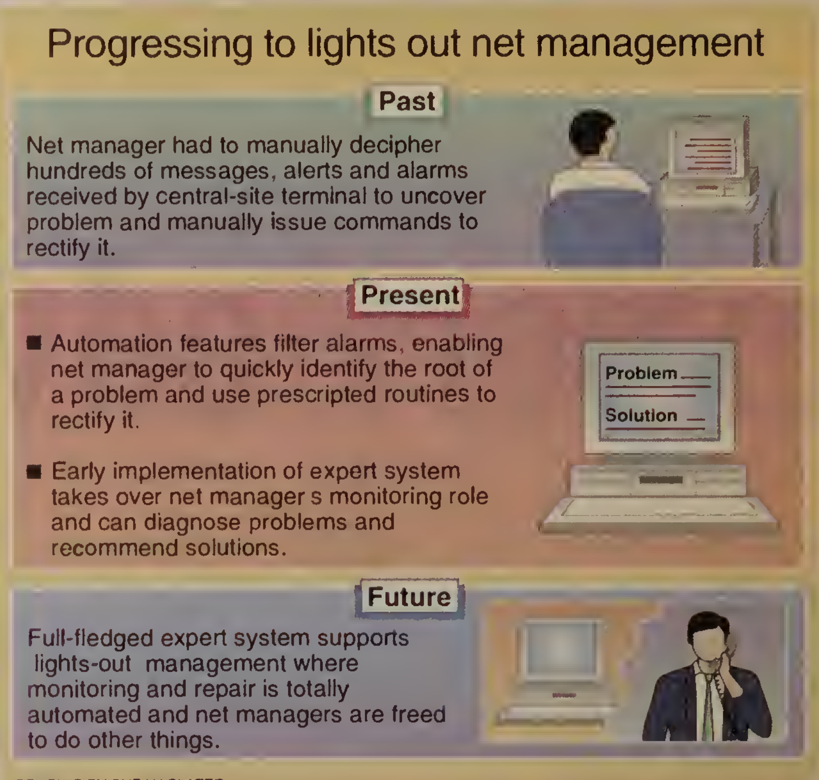
Caterpillar's backbone net comprises 60,000 nodes worldwide, spanning 62 countries. A wide variety of applications run across it, including Systems Network Architecture traffic, full-motion two-way videoconferencing, manufacturing and satellite services, and international voice traffic.

> "We're providing better service to the client and generating more business opportunities," Goldstein says.
>
> ▲▲▲

Because of the tough economic times, users are willing to look at just about anything that will help them save money, according to David Kirk, senior vice-president and general manager of software products at Systems Center, Inc., which offers Net/Master, a net management system with expert system features.

"What's happening is that executives are saying they need to reduce costs by this much, and the only way they think they can do that is to implement technology to offset the cost of human labor," Kirk says.

"Therefore," he continues, "they're looking at almost any aspect of the automation task that will save money, and anything that will do what an operator normally does is fair game. If it takes five minutes to fill out a trouble ticket, they want to automate four minutes of that."



Progressing to lights out net management

Past

Net manager had to manually decipher hundreds of messages, alerts and alarms received by central-site terminal to uncover problem and manually issue commands to rectify it.

Present

- Automation features filter alarms, enabling net manager to quickly identify the root of a problem and use prescripted routines to rectify it.
- Early implementation of expert system takes over net manager s monitoring role and can diagnose problems and recommend solutions.

Future

Full-fledged expert system supports lights-out management where monitoring and repair is totally automated and net managers are freed to do other things.

GRAPHIC BY SUSAN SLATER

Integration is integral

For any expert system to effectively provide these capabilities in today's multivendor network environment, it will first need to be compatible with the various element management systems that are currently on the market.

MAXM, International TeleManagement's (ITM) integrated network management system, is one product attempting to fill the integration gap. The offering runs on an IBM RISC System/6000 and integrates the monitoring and control of element management systems from 70 vendors via expert system capabilities.

MAXM, which can be customized to meet a user's specific net management requirements, automatically consolidates, interprets, filters and prioritizes alarm messages from those element management systems and initiates restoral actions.

It can also translate alarms to generic alerts and send them to NetView through an ITM bidirectional Service Point interface. The ability of NetView to deliver automated command responses may then be applied to SNA and non-SNA devices simultaneously.

"MAXM's primary goal is integrating functionality within multivendor environments," says Mike Calvert, MAXM's product manager. "It was primarily designed to provide NetView with information about non-SNA networks, and that's almost always a multivendor situation."

Some efforts to solve this multivendor management problem revolve around the use of object-oriented technology. An object is software code that contains information about a network. It defines what that device is, what its function is, what it is connected to and how it communicates. These object definitions are then grouped into classes.

Dale Vecchio, director of product marketing, systems and network management products at Systems Center, believes that the next logical step for expert systems to take may involve some

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Software tools bringing expert advice to help desk

The functionality of expert systems with automated capabilities is not limited to network management, as evidenced by the appearance of expert system features in help desk applications.

There are many help desk applications that feature automated expert system-like capabilities. The following three products are examples of what is currently on the market.

Bendata Management Systems, Inc. of Colorado Springs recently released Version 2.0 of its HelpDesk Expert Automation Tool (HEAT).

The new software, which was designed by a consortium of U.S. and Canadian companies, includes such features as advanced report writing, streamlined call logging and access to historical data and configuration information that operates 75% faster than the previous version.

HEAT runs on DOS-based Intel Corp. 80386 personal computers attached to any Network Basic I/O System-compatible local-area network.

It features an expert system that walks help desk staff through a series of procedural steps and provides questions they can ask users in order to first pinpoint the cause of a problem and then offer resolution suggestions.

It also supports a relational database that provides historical information about callers and previous problems with specific pieces of equipment, as well as system configurations and available resources to assist in handling the problem.

According to Bendata, Version 2.0 corrects the problems users had concerning the speed of the initial version and inadequacies in its report writing feature.

A version supporting Microsoft Corp. Windows, complete with a graphical user interface, will be available in the near future. HEAT pricing, which includes the software and six months of support and training, starts at $2,995 for a single-user license.

Another help desk application that offers expert system capabilities is Expert Advisor from Software Artistry, Inc. of Indianapolis.

Expert Advisor's on-line hypermedia decision-tree generator enables help desk operators to add, edit or update diagnostic decision trees with new information so the knowledge base always contains the most up-to-date data.

The product compiles data from the resolution of previous problems and, using this information, generates possible solutions to current problems that are similar, allowing the help desk operator to provide the caller with needed assistance more quickly.

Expert Advisor is available now and runs on most operating systems used for distributed applications, including DOS, OS/2, AIX and Unix. A typical configuration with 15 workstations is priced at $45,000.

Expert systems for the help desk

Company	Product	Price
Answer Computer, Inc. Sunnyvale, Calif. (800) 677-2679	Apriori. Family of software packages that guides user through resolution process and offers dial-in capability for remote users.	Starts at $40,000
Bendata Management Systems, Inc. Colorado Springs (719) 531-5007	HelpDesk Expert Automation Tool Version 2.0. Software that runs on DOS-based 386 PC attached to NETBIOS LAN that guides operator to problem resolution step-by-step.	Starts at $2,995 for single-user license
Software Artistry, Inc. Indianapolis (317) 876-3042	Expert Advisor. Software that allows operators to edit or update diagnostic decision trees.	Typical configuration with 15 workstations costs $45,000

Also, Answer Computer, Inc. of Sunnyvale, Calif., offers a family of help desk software packages — dubbed Apriori — that are designed to streamline customer support organizations that are migrating to distributed multivendor architectures.

Apriori uses a heuristic technology that includes the ability to store problems, remember the steps the help desk staff took in solving them, learn related solutions and coach help desk staff through the problem solving process, regardless of its level of expertise.

The software also offers a dial-in capability so remote users can access the application's Enhanced-Intelligence information base for solutions to problems.

Apriori runs on Sun Microsystems, Inc. SPARCstations, Hewlett-Packard Co.'s 9000 Series minicomputers and IBM RISC System/6000 workstations. It can run over Transmission Control Protocol/Internet Protocol, NETBIOS, Digital Equipment Corp. DECnet and Apple Computer, Inc. AppleTalk networks. A typical configuration starts at $40,000.

— *Skip MacAskill*

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NW Aug 92

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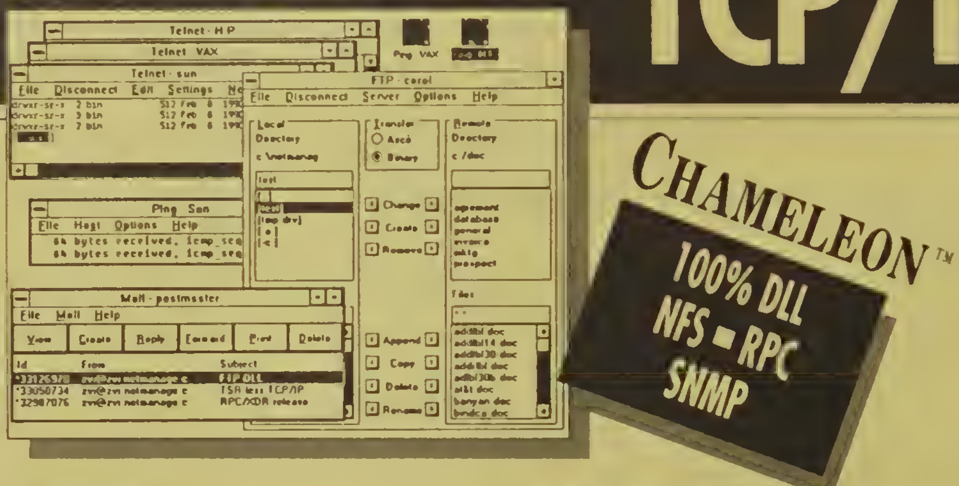
TCP/IP NETWORKING

TCP/IP for Windows



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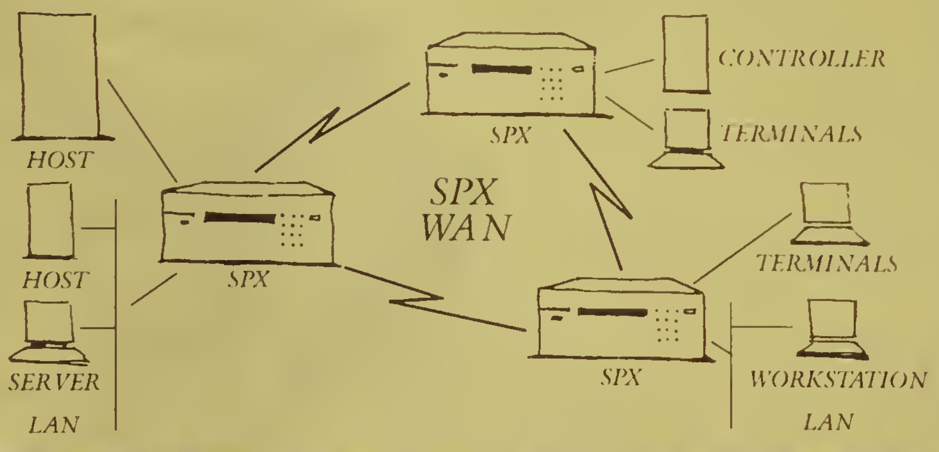

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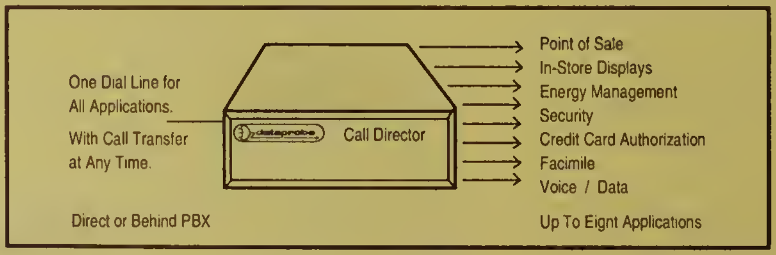

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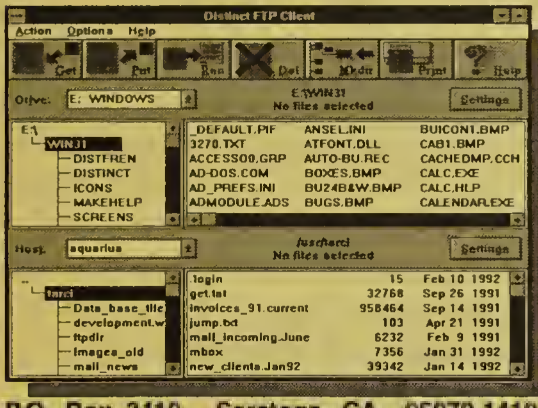

```
E:\WIN31
No files selected

E:\
 WIN31
  DISTFREN
  DISTINCT
  ICONS
  MAKEHELP
  SCREENS

_DEFAULT.PIF     ANSEL.INI      BUICON1.BMP
3270.TXT         ATFONT.DLL     CAB1.BMP
ACCESS00.GRP     AUTO-BU.REC    CACHEDMP.CCH
AD-DOS.COM       BOXES.BMP      CALC.EXE
AD_PREFS.INI     BU24B&W.BMP    CALC.HLP
ADMODULE.ADS     BUGS.BMP       CALENDAR.EXE

/usr/tarci
No files selected

..
 tarci
  Data_base_file
  development.w
  ftpdir
  images_old
  mail_news

.login                  15   Feb 10 1992
get.tat              32768   Sep 26 1991
invoices_91.current 958464   Sep 14 1991
jump.txt               103   Apr 21 1991
mail_incoming.June    6232   Feb  9 1991
mbox                  7356   Jan 31 1992
new_clients.Jan92    39342   Jan 14 1992
```

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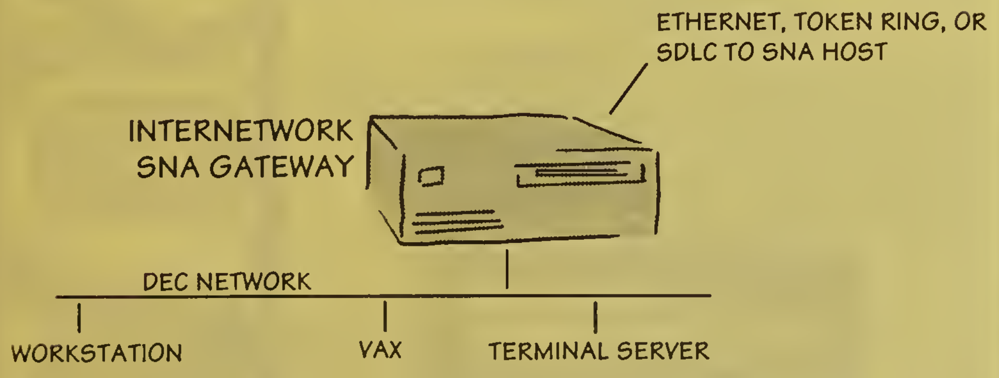

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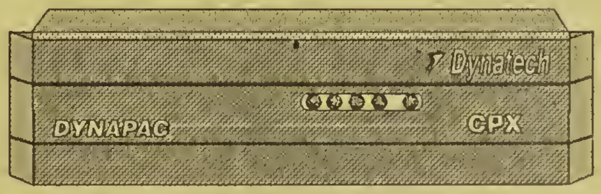

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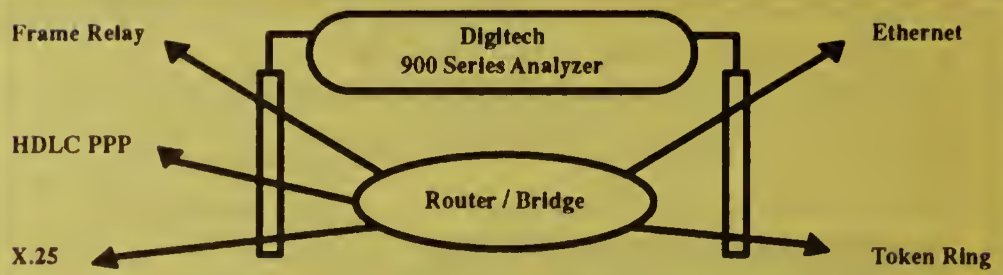

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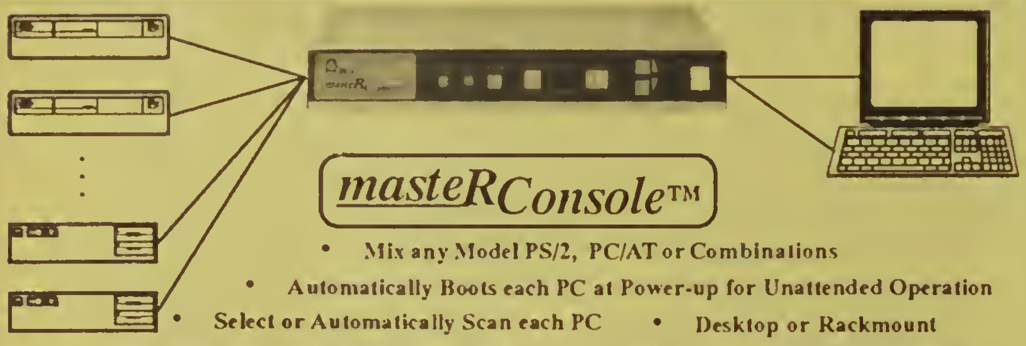

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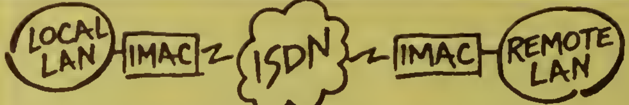

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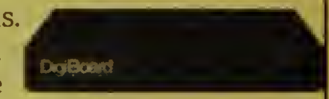

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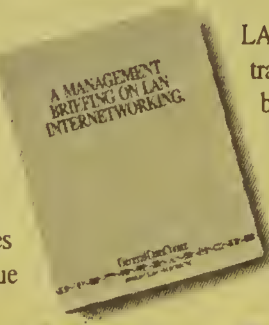

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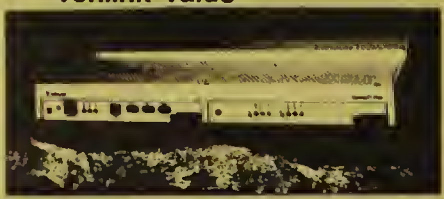

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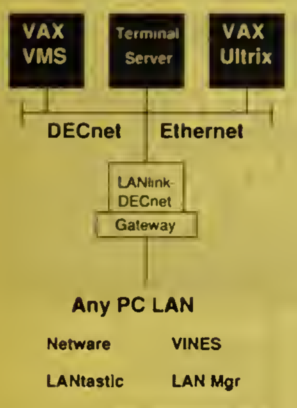

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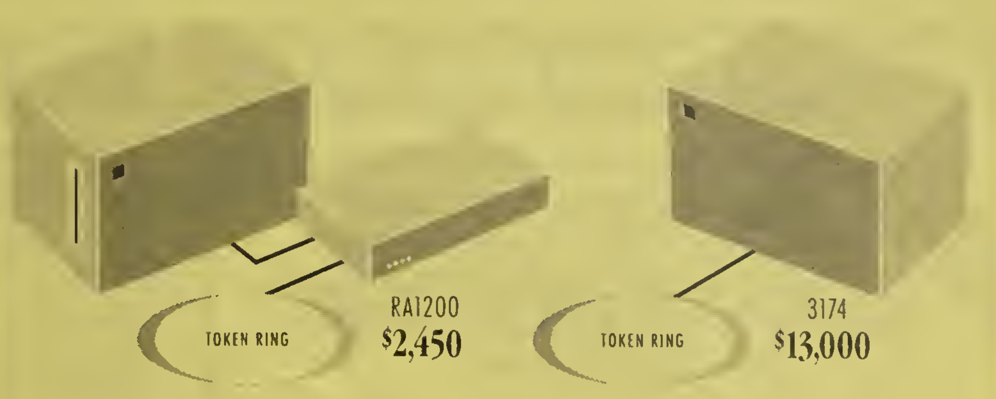

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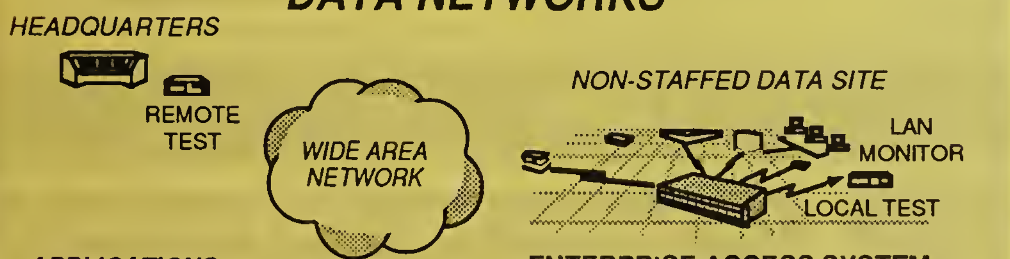

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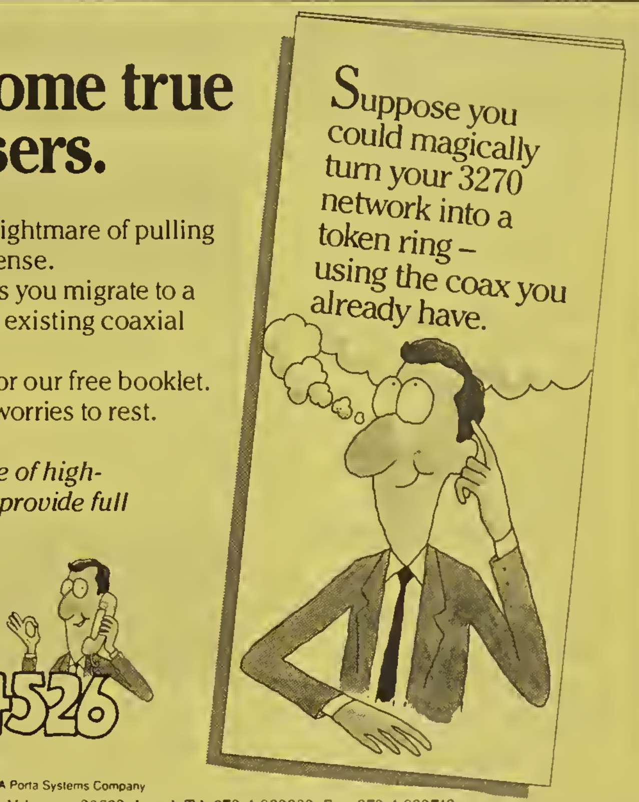
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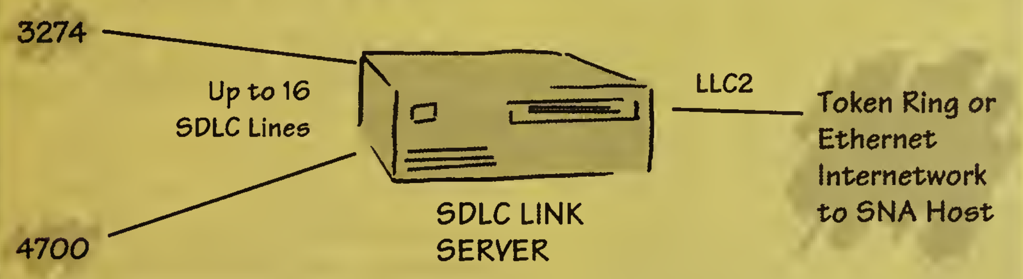

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DATA RACE Announces Multiplexer Breakthrough

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By Paul Longoria

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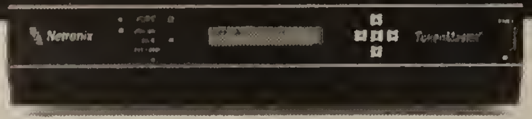

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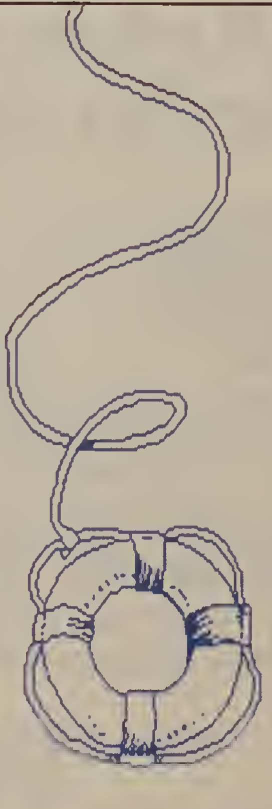

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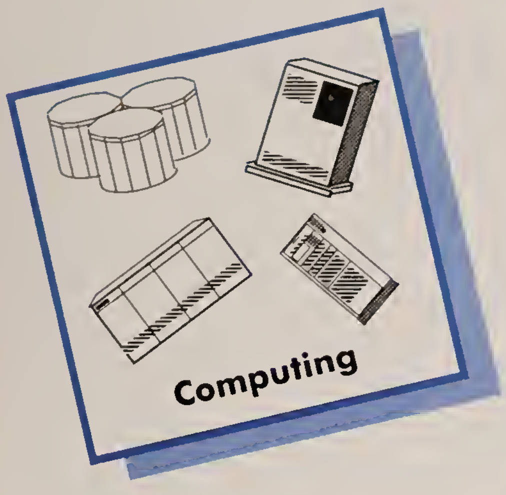

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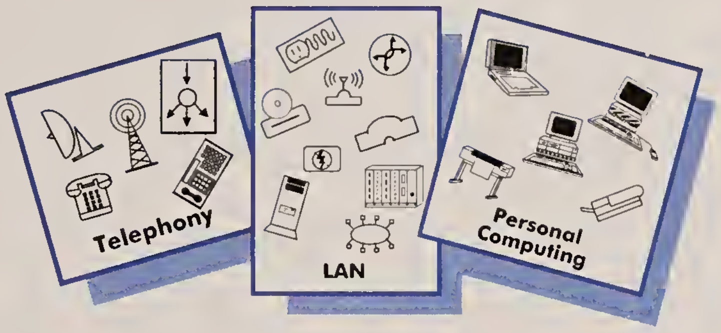

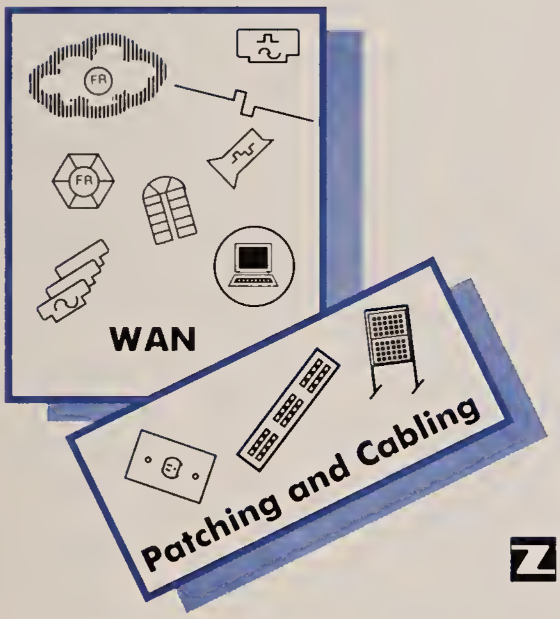

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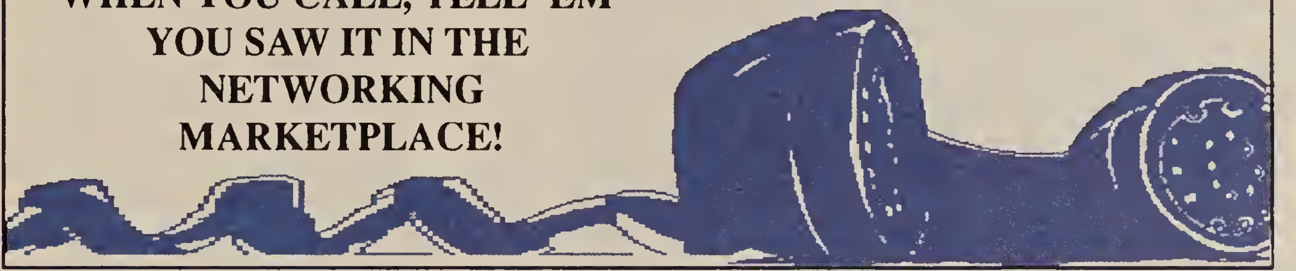

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Tools offer expert advice

continued from page 34

object-oriented technology.

"How object orientation can help implement expert systems in heterogeneous worlds may be an important factor to consider because the whole concept of having object classes and specific methods in responding to some action can really put you in a good position," Vecchio says. "Object orientation may allow you to build code in such a way that you can apply it in a rules-based fashion a lot easier across the enterprise than you can today."

Distributed computing strategies are another issue that may come into play with expert systems. The fact that users are becoming more comfortable with distributing functions across the network, especially down to the workstation level, could drive development of more sophisticated expert systems.

"In many instances, users are reticent to embrace a technology because it's too damn hard," Vecchio says. "It's something that may be a good idea, but it requires too much work. When the tools start to make it easier to do, a technology is more likely to evolve."

The evolution of more comprehensive expert systems and increasingly automated net management functions will gather steam as networks continue to become more diverse and encompassing.

With a network technology such as Asynchronous Transfer Mode — which can integrate voice, video, imaging and data — around the corner, a network manager's job will undoubtedly become more complex and intricate. This means managing the network will become even more difficult and time-consuming.

But if vendors continue to develop expert system and automation applications that will meet a network manager's increasing needs, then the day will come when lights-out management emerges from the confines of the dark network forest and leads the network manager to safety. ◻

MacAskill is a Network World *staff writer.*

Letters

continued from page 29

This simple fact completely undermines the study's conclusion as well as your article's reporting that FTS 2000 rates are routinely as much as 300% to 400% greater for comparable service.

Furthermore, your article's characterization of federal procurement issues and policies is at least six months out of date. You cite a General Accounting Office report, for example, that the agency subsequently modified.

I am seriously concerned that your paper was used as a pawn by the MCI-WilTel coalition.

R.J. Lombardi
Vice-president
AT&T Federal Systems
Silver Spring, Md.

Editor's reply:

Network World *did not side with the WilTel study; we reported on its release and conclusions. When we contacted AT&T for a response, a spokeswoman said the carrier had not seen the study, so we supplied a copy.*

At press time, the spokeswoman indicated the company had been able to do only a "preliminary analysis" and gave a brief response. AT&T was informed before publication that, because its reply came so late, it was necessary to summarize that response.

Banks slow to use technologies

continued from page 27

col/Internet Protocol and Open Systems Interconnection protocols. Proprietary protocols rule bank networks, Teixeira said.

Few banks reported much use of groupware, which is software that coordinates functions among multiple group members. However, 42% of the respondents said they expect moderate use of groupware by 1995, up from just 6% today.

Teixeira said that despite the big bucks banks spend on technology, "from a technological perspective, much of the infrastructure is obsolete."

But there are reasons why banks are migrating slowly from mainframes to newer distributed environments, users said.

David Gusman, a systems officer at Society Corp., a bank holding company in Cleveland, said his company is greatly expanding its use of LANs but acknowledged that banks are likely to hold onto their mainframes for some time.

"The volume of data being handled by banks almost requires that a mainframe be used as a server for core business applications," Gusman said. "What companies need to do is take subsets of larger databases and use the appropriate LAN-based technology to access and manipulate it." ◻

Tests show performance

continued from page 1

finitively establish the winners from the losers," said Kevin Tolly, president of Interlab. "Our tests show that users must challenge this assumption."

Tolly tested 15 bridges as they passed packets between two 16M bit/sec token-ring networks. Starting with 64-byte frames, he examined the devices' performance using progressively larger packet sizes — up to 4K bytes — and found that the ideal bridge varies widely depending upon the application.

"We saw some of the winners become losers and some of the losers become winners," Tolly said. The upshot being that a bridge that was blazing fast in a test could actually be a middle-of-the-road performer in a live internet.

In the 64-byte frame test, Cisco Systems, Inc. and Olicom USA, Inc. token-ring bridges far exceeded the speeds of other bridges, forwarding 11,887 packet/sec and 10,032 packet/sec, respectively. But both fell back into the pack when forwarding 2K-byte frames (see graphic, this page).

Token-ring bridges vie in speed race

Tests reveal bridge performance varies with packet size

	Packet/sec 64-byte packets	Packet/sec 2,048-byte packets	Latency rate (in microseconds)
Cisco Systems, Inc.	11,889	934* (6)	0 (1)
Olicom USA, Inc.	10,032	665 (11)	8 (2)
Madge Networks, Inc. (RB)	9,964	906 (7)	8 (2)
Proteon, Inc.	8,741	972 (2)	8 (2)
Madge (PC version)	7,809	561 (14)	0 (1)
Wellfleet Communications, Inc.	5,362	969 (4)	672 (10)
IBM (8290 model)	3,978	634 (13)	96 (4)
3Com Corp.	3,866	968 (5)	312 (6)
Netronix, Inc.	3,808	857 (8)	0 (1)
IBM (PC version)	3,770	639 (12)	40 (3)
Develcon, Inc.	3,679	518 (15)	632 (9)
Advanced Computer Communications	3,079	776 (10)	328 (7)
Plexcom, Inc.	2,748	972 (1)	200 (5)
Andrew Corp.	2,155	800 (9)	544 (8)
Timeplex, Inc.	1,840	971 (3)	688 (11)

( ) Denotes chronological ranking in subsequent tests. *934 packet/sec = 15.31M bit/sec

GRAPHIC BY SUSAN SLATER

SOURCE: INTERLAB, SEA GIRT, N.J.

Conversely, Plexcom, Inc. and Timeplex, Inc. boxes forwarded 64-byte packets at speeds of only 2,748 packet/sec and 1,840 packet/sec, respectively. But both were front runners when supporting 2K-byte frames.

Plexcom resells its box through an OEM agreement with Raycom Systems, Inc.

These results are significant because traffic on a typical corporate internet consists of larger packets, such as those used in a Novell, Inc. NetWare or Microsoft Corp. LAN Manager file transfer.

Measuring performance using 64-byte packets is largely of academic interest, Tolly said, since virtually no applications use such small packets.

To provide an even more comprehensive evaluation, Tolly employed two additional criteria to gauge a particular bridge's performance. He determined the aggregate throughput the device could achieve between two local-area networks as well as latency, or how long it takes for a single packet to traverse the bridge ("Packet forwarding not the only measure of routers," *NW,* July 6).

Marvin Chartoff, a principal at Ernst & Young in Vienna, Va., said vendor-supplied performance figures are optimized strictly for small packet sizes and do not take into account larger requirements, such as the 300-byte packets found in IBM 3270 terminal-emulation applications or the 2K- to 4K-byte packets found in file transfer applications. "What's needed is a test that uses a hybrid of small and large packets in order to come up with performance that is indicative of a typical user's application profile," he said.

But vendors shy away from tests based on large packets because their products may only register as average performers.

Tolly suggested that users determine how close to token ring's 16M bit/sec wire speed the device can transmit large packets, rather than dither over how well one vendor fares against another on small packet fowarding rates.

Of the 15 bridges tested, six ran at near wire speed using 2K-byte packets, while another four ran relatively close to wire speed. "You can't do better than wire speed. Once a bridge can support the 16M bit/sec in both directions, performance can't be improved upon," Tolly said.

The tests essentially revealed that many bridge vendors are on par in terms of real performance. Therefore, users should focus their evaluations of bridges on how the vendors stack up on other key features, such as latency rate, number of ports supported, management features and, of course, price. ◻

Big Blue makes promise

continued from page 5

the X.500 directory service developed for the OSF's DCE, he said.

Finally, Crotty said IBM will introduce a service to help users design, configure and install OSI nets, similar to the way in which it helps Systems Network Architecture users today with tools such as Network Design and Analysis. The unnamed service is now in pilot form.

"We have a real need right now for X.500 directory services because our electronic mail addresses are extensive," said Doug Harsha, a computer specialist with the U.S. Department of Agriculture (USDA) in Fort Collins, Colo., and an OSI/Communications Subsystem user. "And the ability to link the TCP/IP and OSI environments through OSI/Communications Subsystem would help us integrate our nets and applications."

Users at Proginet Corp., a software development company in Uniondale, N.Y., that uses OSI/Communications Subsystem to develop OSI applications, said the improved offering would be a boon for users.

"Installation help is key because it took us three man-months to install OSI/Communications Subsystems on our PC platforms alone," said Kevin Bohan, Proginet's network manager. "Every user who gets this product has the same problems, so anything IBM could do to make installation and design easier is badly needed."

Proginet and the USDA said other OSI/Communications Subsystem enhancements are also needed. One of their biggest complaints is that the subsystem can store only 750 addresses, be they for applications, users or other systems. In contrast, a traditional SNA-based MVS mainframe can handle more than 10,000 users.

IBM has also limited the number of concurrent sessions the host-based subsystem can support with a personal computer.

"We've gotten two concurrent sessions at once; others have gotten eight, but that's a real hindrance," he said.

IBM said it is working on resolving these problems but did not promise that solutions would come in next year's releases. ◻

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Show highlights emerging era

continued from page 2

than 750 people eager to find out more about groupware products, issues and strategies.

"At the conference, vendors and users had the same concern, and that was how to use this technology to manage business processes," said Ann Palermo, research director of work group and messaging systems at International Data Group in Framingham, Mass.

Carl Pavarini, vice-president of new business development at AT&T in Parsippany, N.J., agreed, adding, "I was stunned by the number of people here. Groupware is coming up fast and is starting to have some impressive demand pull."

Discussion on groupware's role went beyond looking at technological issues; its social context was examined, as well. As the business climate changes during the '90s, groupware is being viewed as a tool to support many firms' attempts to redefine or reengineer business practices.

"With the potential popularity [of groupware] comes a real risk that organizations will do the right thing for the wrong reasons," warned Susanna Opper, an analyst with Susanna Opper and Associates in Alford, Mass. "Simply jumping on the groupware bandwagon without clarity of purpose and business goals will spell certain disaster sooner or later."

Other highlights of the conference included debates on the competing approaches to groupware being posed by Lotus with its industry-leading Notes product and Borland International, Inc. with its evolving desktop-driven groupware strategy.

Lotus is pitching Notes as a complete group collaboration application development platform from which vendors and users can add additional functionality, while Borland believes groupware should provide collaboration capabilities from existing desktop applications.

In the messaging area, the continuing saga of the application program interface wars continued during several conference sessions, but some new signs of cooperation surfaced.

Vendors such as Microsoft Corp., Borland, Lotus and others all pledged they would work together during the next few months to develop common messaging interface standards that could facilitate development of mail-enabled applications.

PHOTO ©1992 CINDY CHARLET

Jim Manzi

"This is not a technical issue — these vendors have to come together for the good of the industry," said Peter Donaghy, manager of customer services and the support laboratory at Hughes Enterprise Information Systems in Long Beach, Calif. "We can't afford to write multiple versions of applications."

Although much of the discussion focused on attempting to define the broadly based groupware area, one analyst, Ronni Marshak of the Patricia Seybold Office Computing Group in Boston, had no problem defining the elusive term. "The best definition I ever heard for groupware was that it's a bad name for some real good stuff," she said with a smile. ◻

SunLink eases connectivity

continued from page 4

integrate NetWare and Solaris environments or to run a strong distributed application, that is where this product will play."

In conjunction with the release, both Oracle Corp. and Ingres, an ASK company, last week announced support of the new NetWare SunLink product. Oracle stated that next month it will bring out Oracle7 and SQL*Net Version 2 for NetWare SunLink, while Ingres said it plans to support NetWare SunLink in Ingres 6.4, which will be available in the first quarter of next year.

"This is a great product," said Kevin Orcutt, systems analyst at Century Technologies, Inc., a system integration company based in Silver Spring, Md., and a beta site for NetWare SunLink. "We love the capabilities. Sun's done a good job on both integration and pricing."

According to Orcutt, Century Technologies currently takes up two floors in its headquarters building. The fourth floor has about 30 personal computers hooked up to a NetWare 2.15 LAN, while the second floor has a few Solaris workstations, a few IBM Personal Computer/RTs and about six stand-alone PCs.

"We want to connect all the machines on both floors into one network," he said, which is why the company decided to test the product.

Orcutt said he has two choices. Either he can upgrade the fourth-floor network to NetWare 3.11 and use Transmission Control Protocol/Internet Protocol to connect the NetWare nodes with the Solaris nodes, or he can implement NetWare SunLink using the existing NetWare version.

Although he said the company has not decided which route to take, Orcutt said the NetWare SunLink alternative will certainly be easier than upgrading the NetWare LAN.

He pointed out, however, two disadvantages of the new product he said he hopes the company will eliminate. First, he said, NetWare SunLink does not support Macintosh clients. Moreover, a majority of NetWare's administrative console tools can only run on a PC attached to the net — they cannot run on a Sun machine.

NetWare SunLink is available now and costs from $995 for a two-client license to $11,000 for a 250-client license. ◻

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Getting users to buy GOSIP prods

continued from page 2

"Last year, we would have said it was mass confusion; now we have to say there's mass apathy."

Last June, Information Strategies asked officials from 19 of the largest military and civilian agencies at 150 government sites about their procurement plans in several areas of information technology, including local-area networks, multimedia, imaging and wireless technologies.

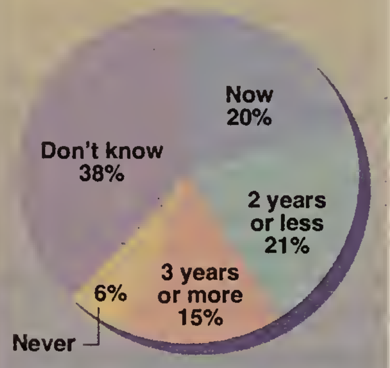
While agencies are investing heavily in LANs and imaging systems, the poll revealed that many information resources managers lack direction on how they will comply with GOSIP requirements (see chart, this page).

GOSIP Version 1.0 stipulates, among other things, that new messaging and file-transfer purchases must adhere to the X.400 Message Handling System and File Transfer, Access and Management (FTAM) international standards.

GOSIP Version 2.0, which takes effect Oct. 3, stipulates support for the Virtual Terminal protocol and the End System to Intermediate System routing protocol in products where those standards are relevant. In addition, Version 2.0 modifies the requirement for FTAM and X.400 products, adding that they must now support Office Document Architecture, a standard for compound documents that may include data, graphics and images.

Telling the GOSIP tale

Describe the time frame for your GOSIP implementation plans:



Based on a survey last June of 19 federal government agencies at 150 sites nationwide.

GRAPHIC BY SUSAN SLATER
SOURCE: INFORMATION STRATEGIES GROUP, VIENNA, VA.

But vendors have done little to see that their products satisfy conformance tests set by the government. So far, only Hewlett-Packard Co. (for X.400 and FTAM) and Novell, Inc. (for FTAM) have passed conformance certification.

Vendors are allowed to sell untested OSI products to agencies accepting them as uncertified, but products must pass the conformance tests before vendors can label them "GOSIP-compliant."

Information Strategies' research showed that "agencies are totally lost. They don't know how to implement open systems or how to cut over," Rather said.

"It'a real pathetic situation," she added, noting groups like the National Institute of Standards and Technology (NIST) and the Corporation for Open Systems International have to do a better job of communicating to government users on the issue. NIST is responsible for establishing GOSIP requirements.

Kevin Mills, chief of the Systems and Network Architecture division at NIST, said he wasn't surprised at the survey's results.

"The government is big. It's difficult to get people going in the same direction," Mills said. "I, for one, didn't foresee that enforcement would be an issue," because agencies have long needed interoperability among their data systems.

More leadership is needed at the agency's top level to plan a comprehensive open systems strategy, he said, adding that NIST also needs to boost its role as an educator.

But Mills said the government is missing a key ingredient in the open systems formula — an OSI-based backbone linking the agencies. The full benefit of OSI cannot be realized until agencies have a means to share data with each other, he said.

Federal Telecommunications System 2000, the government's long-distance network supplied by AT&T and Sprint Corp., could serve as the basis for an OSI backbone network, he said.

Multivendor net challenge starts

continued from page 4

a small portion of the network as a test bed for new software. "We try to do some R&D before we bring things into the environment," he said. Another solution is to wait out a technology. "We run several revisions behind so [vendors] can shake out problems," said Gerald Chisolm, information systems manager at Batterymarch Financial Management in Boston. "Being on the leading edge sometimes means learning brutal lessons," and running a few revisions behind seldom puts you at a disadvantage.

However, if the latest revision or package offers a direct business benefit, a company may want to take the risk of introducing it into the network. "Then you try to minimize your exposure," Chisolm said.

Some users find the hassle of dealing with interoperability problems so difficult they have abandoned their multivendor approach. "Open systems sounds like a great concept, but frankly, it's impractical," Sievers said.

Sievers' firm standardized on IBM software after encountering problems integrating applications.

"We tried to mix and match, and it was too expensive," he said. "Problem resolution was too difficult, and trying to get the products to move in the same direction at the same speed was impossible. It wasn't worth it.

"It's a basic rule of life — simplicity is good. The more complicated things become, the more expensive and harder they are to deal with and maintain," he said.

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AT&T floats plan for overhaul

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per digital termination.

AT&T's DDS rates will increase an average of 0.9%. Users with interoffice channels shorter than 254 miles will see slight increases, while customers with shorter circuits will see decreases of 9.5% to 10%.

Although the company is proposing new rates for the 0-50 mile band for 56K bit/sec DDS, rates for the three other bands will remain unchanged.

The changes would also establish a new multipoint service charge for DDS. Users would pay $15 per termination. No such charge is currently assessed. The term multipoint means that three or more user sites are served by a single circuit.

The proposed increase in DDS rates baffled analysts.

"This shows that AT&T still maintains that DDS is worth two to three times the cost of a DS0," Hills said.

AT&T has also asked to modify its digital private-line discount plan and create another discount plan for access services.

The carrier's Multi-Service Volume Pricing Plan (MSVPP) enables users to consolidate bills for the interoffice channel portion of their T1.5, T45, ASDS and DDS services under a single discount plan based on monthly billing and a term commitment.

The changes would lower the minimum spending commitment threshold from $10,000 to $5,000 and increase discounts for users that sign multiyear contracts for specific services: from 4% to 18% for ASDS at 64K bit/sec and 16% to 36% for ASDS at intermediate speeds; from 23% to 57% for T1.5; from 5% to 40% for DDS; and from 2% to 45% for T45.

The proposal would also add a new discount rate step for a monthly revenue commitment of $75,000. MSVPP currently offers one discount at $50,000 and a larger discount for users spending more than $100,000. AT&T said the move would make the multiservice discount plan more attractive to midsize users.

The carrier has also asked to establish a new discount plan, dubbed Access Multi-Service Volume Pricing Plan (AMSVPP), that will enable firms to get volume discounts on private-line access charges to complement the interoffice channel discount package.

Term plans for AMSVPP would range from $5,000 to $1 million a month for five years. Discounts would top out at 10%.

"Many of our customers asked for an end-to-end approach to private-line marketing," AT&T's Lueckenhoff said. "We wanted to respond to their needs and give them an incentive to stay with us [for dedicated access]."

Hills said AT&T is the first of the Big Three to announce a volume discount plan for access charges. "It's an innovation, one that will eventually be copied."

The changes are scheduled to go into effect Aug. 14, pending FCC approval. ◘

IBM testing Token Rings

continued from page 1

Nolle added, however, that bringing out a LAN product at speeds so close to that of the Fiber Distributed Data Interface would be risky, "especially now that FDDI over copper wire is so practical."

Whether or not the product actually goes to market, analysts agreed that IBM has to do something to accommodate its push into multimedia products.

While a 64M and 32M bit/sec version of Token Ring would suffer many of the same multimedia limitations as FDDI — both use shared media and cannot readily support voice and video — some analysts believe that IBM might be able to tweak the technology enough in order to achieve support for near-term multimedia demands.

Although limited, the benefits would include a lower cost than upgrading to a totally new technology as well as some backward compatibility with existing LANs.

But other analysts suggested that, instead of introducing the faster Token Ring, the company will hedge its bets and focus development efforts on emerging Asynchronous Transfer Mode (ATM) technology, which is ideal for multimedia.

Bringing out a higher speed Token Ring "doesn't make any sense — not with ATM coming down the road," said Todd Dagres, an analyst at The Yankee Group, a research and consulting firm in Boston. "Besides, they just figured out how to do 16M bit/sec over [unshielded twisted-pair cabling], never mind 64M bit/sec."

Others pointed out, however, that ATM is still years away, and many customers today are finding that in bridging and routing network scenarios, the bottleneck is not caused by the internetworking device, but rather by the speed of the wire. Customers, therefore, could benefit from faster technology sooner than ATM will be able to provide it.

"Now the bottleneck is no longer the bridge, but the Token Ring," said Kevin Tolly, president of Interlab, a network testing and consulting firm in Sea Girt, N.J. "Once the bridge or router reaches 16M bit/sec, you can't improve performance unless IBM comes out with a faster Token Ring."

Other industry observers simply said the higher speed — perhaps 32M bit/sec — would be a logical next step for the company's Token Ring technology.

"This is a natural progression for the Token Ring architecture," said Barry Gilbert, an industry analyst at the Acton, Mass., office of Computer Intelligence, a research house based in La Jolla, Calif.

"The 4M bit/sec Token Ring could be used for small work groups, the 16M bit/sec for higher end work groups or as a low-end backbone, and the new Token Ring could serve as the high-end backbone," Gilbert said. ◘

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Group prods integration

continued from page 4

and director of business development at Bell Atlantic Business Systems Services. As a result, network management systems are increasingly standards-based while most system management products are still proprietary.

Emergence of systems management standards will speed development of systems management applications and make it easier for users to manage the diverse array of computers and software in their networks. The standards will also make it easier for service and support providers to remotely troubleshoot networked computers.

"If a server runs out of disk space [before you] realize something is wrong, you have a much larger problem than if you [could] monitor performance data that tells you in advance disk space is 80% exhausted," Edgerton said.

Rick Hornbeck, network administrator at Deaconess Hospital in Evansville, Ind., said standards-based systems management tools are badly needed and will aid in such tasks as software distribution. "Systems management has been almost totally ignored from an open systems approach," he said.

The major benefit for vendors is that they will be able to cut development and training costs, Edgerton said. A provider of multivendor support services could train staff members to handle a single set of management data rather than proprietary data.

The DSIS Group will push for standards in the areas of fault, configuration, performance, security and accounting management, Edgerton said. A management system that supported the standard would, for example, be able to predict problems on networked workstations using information provided on disk capacity or CPU utilization. While the group will target management of desktop computers, standards supported by the DSIS Group will also apply to minicomputers and mainframes.

The DSIS Group will exhibit the first fruits of its labor at the INTEROP 92 Fall trade show in San Francisco this October, where the organization's members will run an interoperability demonstration of a draft SNMP MIB for system management.

The Internet Engineering Task Force formed a Host Resource Working Group earlier this year to develop the MIB, a draft of which was released last month, Edgerton said.

For more information on the DSIS Group, call Edgerton at (215) 296-6159. ◘

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ALLIGATORS IN THE SWAMP

Unforeseen problems that can put the bite on your network

Distorted digits derail videoconferencing venture

By JACK SOBISH

Like most organizations, my company, Dow Corning Corp., is always looking to save money. One way of doing this, we decided, would be to provide videoconferencing sessions on a switched basis, rather than reserve bandwidth on our T-1 links strictly for video traffic.

We believed switched videoconferences over existing T-1 lines would allow us to make better use of the facilities, providing other users with the bandwidth when videoconferencing was not in use.

Little did we foresee the alligators we would encounter.

Our ultimate goal was to support videoconferencing among four domestic sites, two international sites and customer locations via a combination of private and switched services.

The first phase, in which we deployed videoconferencing rooms at our U.S. and European locations, went off without a hitch. Unfortunately, we weren't so lucky with the second phase, in which we tried to initiate switched videoconferences among three of our domestic sites.

In addition to some minor inconveniences, we were haunted by a recurring problem in which our terminal interface units (TIU), which dial the phone number of the site with which a videoconference will be established, were dropping dialed digits.

We sighted the first alligator when we attempted to test the switched access to the videoconferencing net.

Our net setup is such that the primary site, our corporate center in Midland, Mich., served as the hub for our private T-1 network. The second site, an engineering and manufacturing plant located five miles away, was linked to the corporate data center via a pair of T-1s. The third site, another engineering plant located in Kentucky, 400 miles from the corporate data center, also used a T-1 to link to the data center.

In addition, a dedicated 384K bit/sec link, used for an existing videoconferencing application, connected the local plant and the Kentucky plant via the T-1 hub at the corporate center. To enable the two plants to toggle between this dedicated link and switched access to the T-1 net, we installed A/B switches at both plants.

With this done, we decided to test each location's ability to establish a switched videoconference over the T-1 net. This involved verifying a good connection from the T-1 muxes at each site to the long-haul carrier.

We did this by setting a loopback on the muxes' I/O ports to which each site's videoconferencing equipment was attached. The carrier then transmitted a test pattern through the T-1 network and waited for a return pattern from each site to ensure that the connection was sound.

Although the corporate site and the Kentucky plant passed the test, the local plant failed.

After verifying the programming for the I/O ports at the local plant, we swapped and replaced the I/O port cards to isolate a potential hardware problem in the mux equipment. After a few days of swapping and retesting, we became aware that during the testing, the T-1 line was experiencing errors. The higher the load on the T-1, the more the circuit degraded.

We turned the circuit over to Michigan Bell Telephone Co. for repair. After two weeks of searching, the carrier discovered the cause of the errors: the main feed cable containing our T-1 circuit from Michigan Bell to the local plant was bridged to another cable that was not terminated. Once the cable was terminated, the circuit was restored.

Calling all sites

The next step was to test inbound and outbound calling between the corporate site and both plants. That's when the second alligator struck. We sent ten test calls each from the corporate site to the local plant and to the Kentucky site, all of which were successful. However, neither the local plant nor the Kentucky site could call outbound to the corporate site.

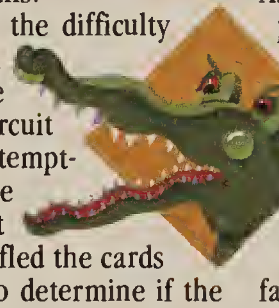
We enlisted the aid of our carrier's test center to trap the digits as the TIUs at these two sites were dialing. We quickly discovered the TIUs were either losing or distorting dialed numbers before they reached the switching center.

So we called the coder/decoder manufacturer. But when the manufacturer demonstrated that the digits were being transmitted accurately to the TIUs, we were back to square one again.

Looking for a starting point, we began by swapping the corporate center's assigned DS0 channels, which we knew worked, with the local plant's assigned channels.

If the problem moved from one site to the other, it would have to be between the T-1 hub at the corporate center and the service provider.

However, when the test calls were made, there was no change in the results. The corporate center could place and receive calls; the other two sites could only receive calls.



We then thought the difficulty might be in the T-1 mux at the corporate site. We replaced circuit cards in the hub, attempting to isolate the problem. When that didn't work, we shuffled the cards in the hub chassis to determine if the chassis had bad slots.

That didn't work, either. Because the weekend was approaching, we restored the network to its original configuration and successfully tested the corporate site's ability to place and receive calls.

On Monday, we began testing and swapping the circuit cards at the local plant. Then the third alligator struck: we were informed that the corporate site could no longer initiate calls. Because we had made sure videoconferencing was working at that site before we left on Friday, we were stumped.

It turned out that while working on another customer's T-1 circuit during the weekend, our carrier had inadvertently changed a parameter on our T-1 circuit. Once the T-1 was restored, the corporate site was able to videoconference again.

By this time, we were beginning to suspect the TIUs were corrupting the digits. To test this theory, we swapped the units at the corporate site with the units at the local plant down the road. If the problem moved, it would indicate the TIUs were bad.

At the same time, one of our engineers made calls to our TIU manufacturer to find out if there were any known problems with the units.

Swapping TIUs did not solve the problem. The local plant's TIUs worked perfectly at the corporate site, while the others failed at the plant.

After a few more days of trying to isolate the problem, we hit pay dirt. The TIU manufacturer acknowledged a glitch with the dialing subroutines in the firmware of our TIUs. The problem distorted the dialed digits passed by the TIU to the network. Fortunately, the TIU vendor was in the process of developing a firmware fix.

A week later, we received and installed the new firmware. We then tested the plants' ability to establish their own video sessions on a switched basis. Astonishingly, both sites could now place and receive calls.

One last mystery remained: Why did the corporate site's TIUs fail at the local plant? And why did the local plant's TIUs work at the corporate site when they were swapped?

The answer was in the TIU interfaces used at each site. At the local plant and Kentucky site, the connection between the TIU and the mux equipment involved a V.35 interface. The corporate site, however, used a four-wire interface. If the destination of the outbound digits involved a V.35 interface, the TIU firmware corrupted the digits. If the destination was a four-wire connection, no corruption occurred.

Lesson learned

It seems the moral to this story is to verify the unknown before condemning the known. When trouble appeared, we spent a lot of time investigating our mux equipment, which had been stable for over a year, rather than the TIUs, which were new to the network. We assumed by swapping TIUs between sites, we were verifying their working condition. We failed to recognize that the setup at each site could affect the TIUs' performance. Because of that, the alligators almost triumphed. ◘

Sobish is a network analyst at Dow Corning in Midland, Mich.

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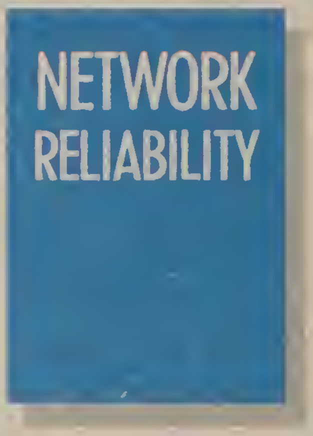

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